



Guardall

Windsor 500

Installation Manual

Issue C

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CE Declaration

This product is compliant with the EC directive 89/336/EEC on electromagnetic compatibility.

To comply with this directive it is essential to fit all 11 screws when mounting the main control PCB into the case and to avoid routing any cable under or over the main PCB.

This product complies with the requirements of EN 60950. The following information is essential for the safe installation and operation of this equipment.

Mains

As the system uses hazardous voltages it is recommended that the mains supply connection follows national wiring rules and is carried out by a suitably qualified person.

This equipment must be permanently connected to a mains fused spur (3A or 5A). Knockouts are provided on the top and sides of this equipment and these are intended for conduit or cable glands.

Mains Supply

Rated Voltage	230 V a.c. +/- 10%
Rated Current	270 mA
Mains Fuse	250v 630mA F

This class II equipment must be isolated from the mains supply before accessing hazardous parts.

Auxiliary DC Supply

The DC supply output of this equipment is a Safety Extra-Low Voltage (SELV) circuit. The DC supply rating is for all the DC requirements including recharging the battery. The supply has the following rating:

Output Voltage	13.7 dc nominal
Continuous rated current	2.0 amp
PSU Aux. DC supply fuse rating	250v 1.0A type F
Battery supply fuse rating	250v 2.5A type F
Aux. DC supply fuse rating	250v 1.6A type F
Aux. DC supply (speaker) fuse rating	250v 800mA type F

All wiring in this enclosure requires to be V-2, IEC approved or PVC type.

The installation wiring within this equipment should utilise plastic cable ties to provide a means of strain relief.

System Components

A Windsor system comprises of 5 basic components;

1. The Windsor control unit, which processes all the alarm information from the detection points. Outputs are provided to operate sounders, strobe and communication devices. Configuration information is stored in battery backed RAM (Windsor Mk1, PC787) or EEPROM (Windsor 500, PC820). A printer port is provided on board.
2. User interaction with the system is via a two line 32 character backlit LCD. Up to 8 may be connected. There must be at least 1 keypad on a system.
3. A low cost electronic keypoint can be fitted in place of a keypad. This allows a user to set and unset by using an electronic key. Electronic keys may also be used on keypads. Up to 7 keypoints can be connected to a system.
4. An INOVA Cardpoint may be fitted in place of a keypad. This allows a user to set and unset by using an access control system card. Up to 7 INOVA Cardpoints can be connected to a system.
5. All detectors are connected to the system through concentrators. Concentrators can be connected inside the control panel case (referred to as internal concentrators) or external to the control panel on a 4 wire bus. Up to 16 concentrators can be connected in a system.

There are 3 concentrator types; NEOL (no end of line), EOL (end of line) and HS (high security). Any combination of types is allowed in a system. A maximum of 3 internal concentrators can be fitted in the control panel case. HS types are available only as external concentrators.

Inside the control panel case there is also space for;

- TX or Relay output PCBs
- SmartDial Super Dialler/Modem
- Windsor modem
- RS232 interface PCB
- Plug on STU
- SmartCard interface (Windsor Mk1, PC 787 only)

Other Windsor components include;

- External concentrator output daughter board
- Mains switch unit for connection on the external concentrator bus.

Compliance standards is to individual country requirements / specifications.

System Components**Order Codes**

Variant	Panel	Language Pack	W500 Kit¹
UK Standard 128 (English)	73377	73403	73622
UK Standard HS (English)	73378	73404	73633
Chubb Alarms 128 (English)	73375	73382	
Chubb Alarms HS (English)	73376	73419	
Generic Panel (no software)	73339		
128 French		73385	73624
HS French		73386	73635
128 Italian		73383	73623
HS Italian		73384	73634
128 Dutch		73387	73628
HS Dutch		73388	73639
128 Czech		73391	73626
HS Czech		73392	73637
128 Finnish		73389	73625
HS Finnish		73390	73626
128 Slovak		73393	73627
HS Slovak		73394	73638
128 Croatian		73395	73629
HS Croatian		73396	73640
128 Hungarian		72288	72285
HS Hungarian		72289	72212
128 Portuguese		72292	72222
HS Portuguese		72294	72223

Variant	Keypad	Keypoint	Cardpoint
UK Standard	73161	73149	72883
Chubb Alarms	73166	73154	72894
French	73162	73150	
Italian	73163	73151	
Dutch	73167	73155	
Czech	73172	73159	
Belgian	73168	73156	
Finnish	73169	73157	
Lips Beveiliging	73173	73160	
Portugese	73171		

Windsor Concentrator W Numbers	
Internal EOL Concentrator (2k/8k2)	72315
Internal NEOL Concentrator	72316
Internal HS EOL Concentrator (8k2/8k2)	73601
HS plastic concentrator	73565
HS metal concentrator	73566

Power Supplies	
2.2 A in Windsor 500 case	73332
1.5 A in Windsor 300 case (includes battery monitoring)	73333
1 A in small metal case (7A battery capacity)	73334

¹ Control panel, Keypad, HS plastic concentrator, manuals and software.

Communications	
SmartDial Super	73460
Windsor modem for 500 panel	73535
Windsor Modem for 700 panel (V23)	73606
Windsor Modem for GuardStation UK	73534UK
Windsor Modem for GuardStation EU	73534EU
GSR Remote Version 2	73429
GSR Direct Version 2	73537
Guardall Managed Reset PC software	72951
AV60 UK	73582
AV60 France	73583
AV60 microphone expansion PCB	73584
AV60 microphone	73585

Windsor Product W Numbers	
Main PCB (PC820/1) STD UK	73411
Main PCB (PC820/2) EURO	73380
Main PCB (PC820/3) IMQ	73412
TX Communication PCB	72259
Relay Output PCB	72258
Ext. Conc. Daughter Board	78036
Mains Switch Unit	72271
RS232 Interface PCB	73418
SmartKey (2 Off)	72993
Panel Printer Cable Assembly	73379
Engineering Instructions	73420

System Components**Technical Specification**

Electrical	
Mains Input	230V AC (+10% -15%) 50/60 Hz
Mains fail detection	Loss of AC supply
Power supply voltage	Normally +13.7V
Low voltage detection	11V DC
Power fail detection	10.7V DC
Power supply output	2 amps
Load current	500 mA to ensure 8 hours standby 6 Ah
Load current	1 amp to ensure 8 Hours standby 15 Ah
Standby battery	6 Ah, 15 Ah or 2x 6 Ah lead acid rechargeable

Environmental	
Temperature range	-10 to 50 °C (0° - 40° for control panel)
Humidity	10% to 90% relative humidity

Dimensions	
Control panel	335 x 455 x 116 (W x H x D) mm (Windsor Mk 1)
Control panel	365 x 445 x 110 (W x H x D) mm (Windsor 500)
Keypad	155 x 105 x 25 (W X H X D) mm
Keypoint	90 x 90 x 25 (W X H X D) mm
External Concentrator	125 x 215 x 50 (W X H X D) mm

Packed Weights (Approximate)	
Control panel assembly	8.5 kg
Keypad	0.35 kg
Keypoint	0.25 kg
External Concentrator	0.35 kg

System Components**Cable Type**

Windsor has two 4 wire buses, one for the user interfaces and one for the concentrators. The recommended cable type is 7 strand/0.2mm² diameter un-screened cable which has a resistance of 90 ohms/km and a core to core capacitance of 100nF/km. The screened cable referred to in this manual has the same resistance as un-screened cable but has a higher capacitance of 250nF/km between any core and the screen. **If screened cable is used it should be terminated in the Windsor control panel and connected to earth.** Refer to the section on user interfaces and concentrators for details of the maximum length of cable on each bus.

System Components	Current Consumption
Current Consumption (mA)	
Control Board	60 ²
Keypad	20 ³
Keypoint	30 ⁴
Inova Cardpoint	50 ⁵
External concentrator	15
Internal 4 point concentrator	50
Internal 8 point concentrator	30
TX Communication PCB	30
Relay Output PCB	160 (All relays on)
SmartDial	30
Daughter Board	15 (all LEDs off)
Excalibur Switch Unit	5
Level Shifter PCB	20

The following example shows the average system current (excluding sensors) for a typical system at a supply voltage of 13.7 volts.

Control Unit	60 mA
1 Keypad	20 mA
1 Keypoint	30 mA
3 Concentrators (Ext)	45 mA
TOTAL	155 mA

The table below shows the available auxiliary current for various battery sizes using the above typical system current.

24 hour battery re-charge time with a minimum 8 hours standby					
Battery Size	Ave. 24hr recharge current	System current maximum	Available backup period	Windsor current (example system)	Available Current (for sensors etc.)
6 Ah	600 mA	750 mA ⁶	8 hours	155 mA	595 mA
12 Ah	1.2 A	800 mA	15 hours	155 mA	645 mA
15 Ah	1.5 A	500 mA	30 hours	155 mA	345 mA

To obtain the maximum system backup current from a given size of battery for 8 hours standby additional auxiliary PSUs are required.

Maximum system current for 8 hours backup with auxiliary PSUs				
Battery Size	Ave. 24hr recharge current	System current maximum for 8 hours backup	System current from Windsor PSU	Aux. PSU current required
12 Ah	1.2 A	1.5 A	800 mA	700 mA
15 Ah	1.5 A	1.875 A	500 mA	1.375 A

² The control board current does not include the battery monitor LED current. Each battery monitor LED will add 10mA to the total control board current.

³ This is the basic keypad current. The backlighting will add 80mA and the buzzer 25mA.

⁴ This is the basic keypoint current. The buzzer will add 25mA

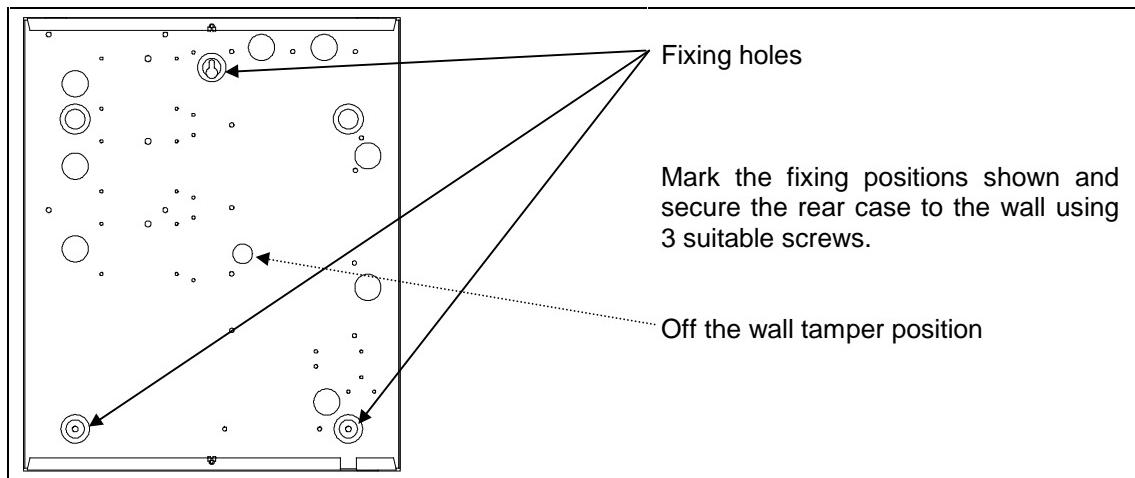
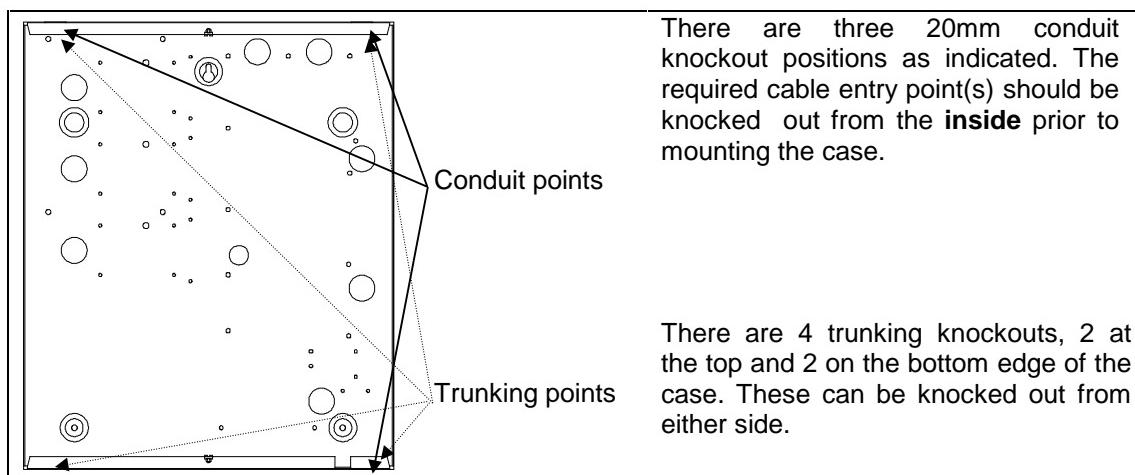
⁵ This is the quiescent current. The maximum current with the door unlock relay on is 90mA.

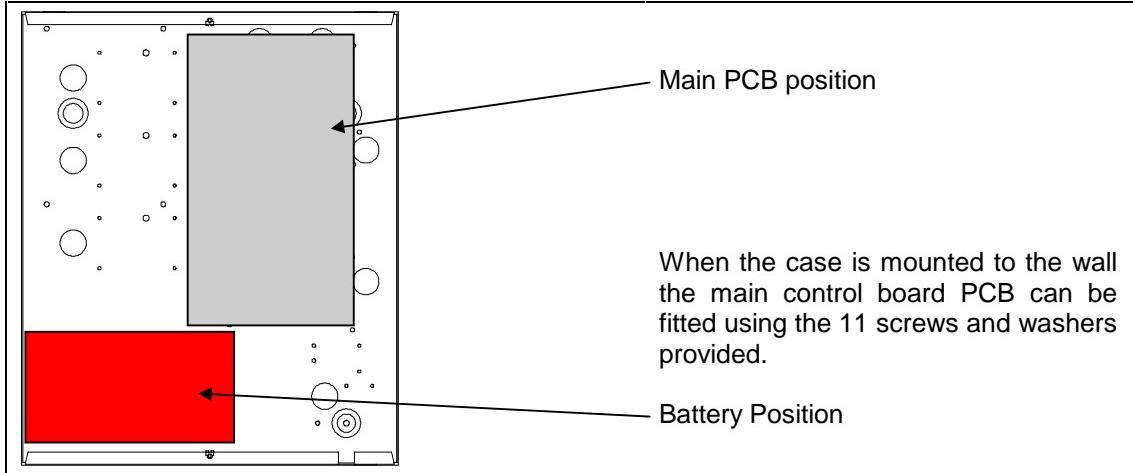
⁶ This is the maximum current that a 6 Ah battery can provide for 8 hours backup.

Main Control Unit**Main Control Unit****Installation**

The Windsor control panel is supplied with a spares bag containing the following items;

- Case tamper tube (70mm) and spring
- Off the wall tamper plug, switch and spring
- Fuse 630mA
- Battery lead
- Mains cable clamp and two No 6 x 3/4" screws
- Cover earth wire assembly and M4 nut



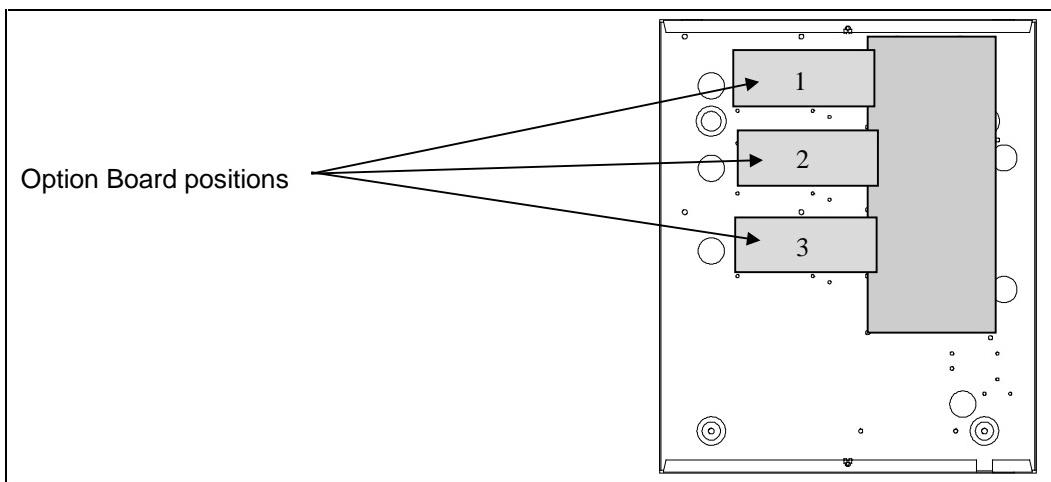


On completion of the control panel mounting and connection, the lid earth cable must be connected. Connection should be made to the screw securing the transformer earth.

Main Control Unit

Option Boards

Before fitting an optional board fit the stand-offs to the board. Push the board over the main control board connector pins and screw the self-tapping screws into the rear case through the stand-offs. Ensure that the LK2 on the main PCB is moved to the correct position for the number of fitted option boards (see Main PCB Connections). For details of the option board refer to the Internal Serial Bus (ISB) section.



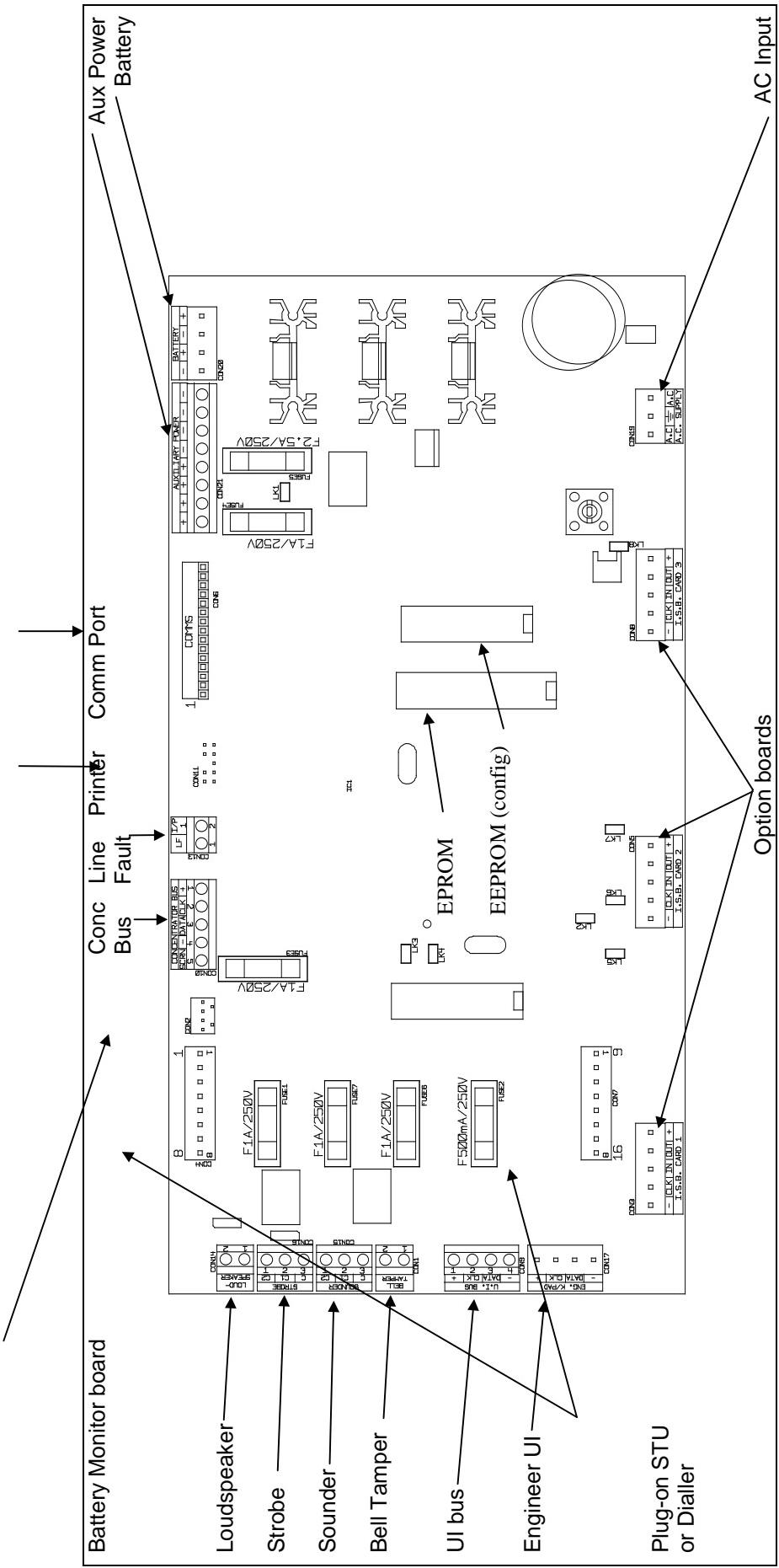
Main Control Unit**PCB Connections**

The main PCB connectors are shown below. Each connector terminal is described in the connection table. When connecting cables to the Windsor main control board it is essential to avoid routing the cables under or over the board.

Connector	Function	Terminals
CON 1	Bell Tamper	1,2 Normally closed loop
CON 2	Battery monitor	1 12v 2 Battery charging (Red) 3 Battery present ⁷ (Amber) 4 Mains present (Green)
CON 3	Internal Serial Bus PCB 1	Refer to ISB links LK5, LK6 & LK7
CON 4	STU	Refer to programming manual for PIN functions.
CON 5	Internal Serial Bus PCB 2	Refer to ISB links LK5, LK6 & LK7
CON 6	Serial Port	1 +12V 2 TXD 3 RXD 4 RTS 5 CTS 6 DTR 7 DSR 8 DCD 9 RI 10 No Connection 11 No Connection 12 +5v 13 No Connection 14 0v 15 No Connection
CON 7	STU	Refer to programming manual for PIN functions.
CON 8	Internal Serial Bus PCB 3	Refer to ISB links LK5, LK6 & LK7
CON 9	UI Bus (keypads)	1 +12V 2 Clock 3 Data 4 0V
CON 10	DGN Bus (concentrators)	1 +12V 2 Clock 3 Data 4 0V 5 Screen(optional)

⁷ The battery present LED will only function if the panel is programmed to test the battery.

Connector	Function	Terminals
CON 11	Printer Serial output with 8 data bits, 1 stop bit and no parity. Baud rate programmable 9 8 7 6 ● ● ● ● ● ● ● ● 5 4 3 2 1	1 No Connection 2 RXD 3 TXD 4 No Connection 5 0v 6 No connection 7 RTS 8 CTS 9 No connection
CON 13	Line Fault/Default	1 Line Fault (pull to 0v for fault condition) 2 Default Configuration (connect to 12v)
		<i>This input should only be used if a 3rd party communicator is being triggered from a TX or relay output. In all versions prior to v3.00 fitting the default link will also clear the event log.</i>
CON 14	Loudspeaker	1, 2 loudspeaker +, - <i>This output is protected by fuse 1.</i>
		<i>Minimum load 16 ohms</i>
CON 15	Sounder	1 Normally Closed <i>This output is protected by fuse 6.</i>
		2 Normally Open 3 Common
		<i>This is the energised state (default). The sounder relay can be inverted by software.</i>
CON 16	Strobe	1 Normally Closed <i>This output is protected by fuse 7.</i>
		2 Normally Open 3 Common
		<i>This is the energised state (default).</i>
CON 17	Engineer Keypad	1 +12V 2 Clock 3 Data 4 0V <i>Fit LK3 if an engineer keypad is connected. If this link is fitted and no engineer keypad is connected then all keypads will respond more slowly.</i>
CON 19	AC input	Transformer secondary connector
CON 20	Battery	Battery connectors <i>The battery is protected by fuse 5.</i>
CON 21	Aux. power outputs	1 12v 2 12v 3 12v 4 12v 5 0v 6 0v 7 0v 8 0v <i>All 12v connections are protected by fuse 4.</i>



Main Control Unit**PCB Links**

Link	Function	Comments
LK1	Battery connect	When fitted the panel can be powered up on battery power only. When fitted deep discharge protection is disabled.
LK2	ISB	Fit the ISB link on LK2 if there are no ISB PCBs fitted. (Fitted as default)
LK3	Engineer Keypad	Fit the link if you require Windsor to communicate with a keypad addressed as KP0.
LK4	Power-up set	If the link is fitted Windsor will return to the set condition that the system was in when power was removed. There will be a 1 minute delay to allow the sensors to stabilise.
LK5	ISB	Move the ISB link from LK2 to LK5 if there is 1 ISB PCB fitted.
LK6	ISB	Move the ISB link from LK2/LK5 to LK6 if there are 2 ISB PCBs fitted.
LK7	ISB	Move the ISB link from LK2/LK5/LK6 to LK7 if there are 3 ISB PCBs fitted.
LK8	Off the Wall Tamper	Off the wall tamper disable when fitted

Main Control Unit**PCB Fuses**

Fuse	Type	Function
Fuse 1	1A/250v, 20 mm, quick blow (F)	Loudspeaker
Fuse 2	500 mA/250v, 20 mm, quick blow (F)	UIB (keypads)
Fuse 3	1A/250v, 20 mm, quick blow (F)	DGN (concentrators)
Fuse 4	1A/250v, 20 mm, quick blow (F)	Aux. Power
Fuse 5	2.5A/250v, 20 mm, quick blow (F)	Battery
Fuse 6	1A/250v, 20 mm, quick blow (F)	Sounder
Fuse 7	1A/250v, 20 mm, quick blow (F)	Strobe
mains	250v, 630mA, quick blow (F)	Mains terminal block

Main Control Unit**PCB Relays**

Relay	Type	Function
RL1	Single pole changeover 2A maximum	Battery disconnect
RL2	Single pole changeover 1A maximum	Sounder
RL3	Single pole changeover 1A maximum	Strobe

User Interfaces

Windsor can have up to 8 user interfaces connected on the keypad bus (CON 9) and an engineer keypad⁸ connected directly to the main PCB (CON 17). User interfaces can be either an LCD keypad, a Keypoint or an INOVA Cardpoint. All user interfaces are connected to Windsor on a 4 wire bus.

User Interfaces	Cable Length
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The maximum length of cable for a single keypad is shown in the table.

Maximum Keypad Cable Length (m)		
Power Source	Un-screened Cable	Screened Cable
Control Panel	600	400 ⁹
Local Aux. PSU	800	600

If auxiliary PSUs are used then all 0v connections must be connected to the control panel 0 volt terminal.

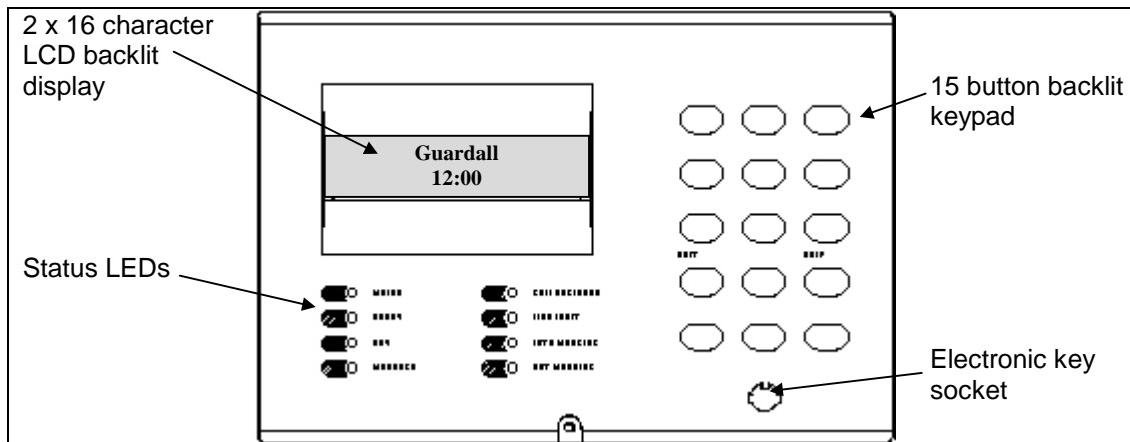
It is not recommended to share a sensor connection and keypad bus in the same cable.

⁸ An engineer keypad is any keypad addressed as keypad 0. A keypad with address 0 could be connected to on the UI bus rather than the engineer keypad connector. The configuration for Keypad 0 cannot be changed.

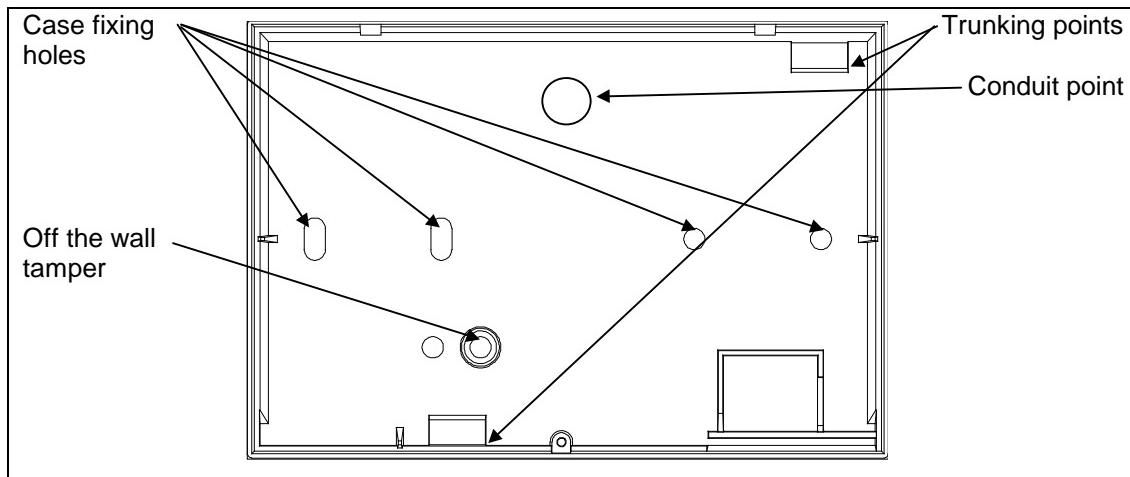
⁹ The maximum length of screened cable can be increased to 500m by using 2 cores for the positive and ground supply to the keypad.

User Interfaces**Keypad**

The Windsor keypad has a 2 line by 16 character backlit LCD, a 15 button backlit keypad, 8 status LEDs and an electronic key socket as standard. All keypads are connected to Windsor on 4 wire UI bus.

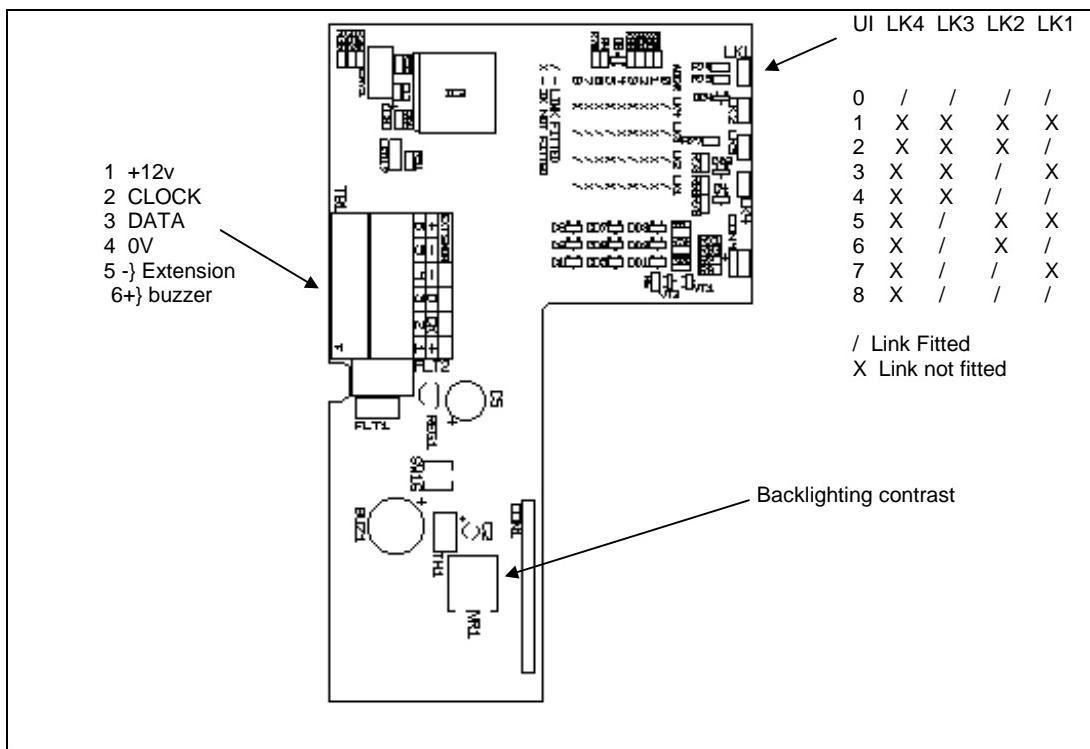
**Keypads****Installation**

The keypad should be fixed to the wall through using the fixing holes provided. If the off the wall tamper is being used then the tamper knockout should be removed prior to mounting the rear case.



Keypads**Addressing**

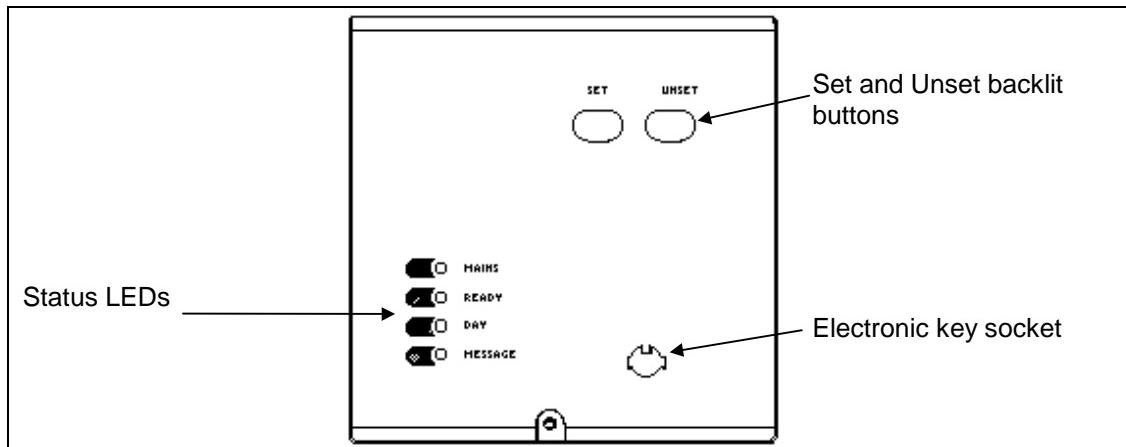
All keypads are identified by a unique address which is set using links on the keypad PCB. The keypad addresses must be in sequence from 1 up to the maximum number specified in the **System Size** programming option.



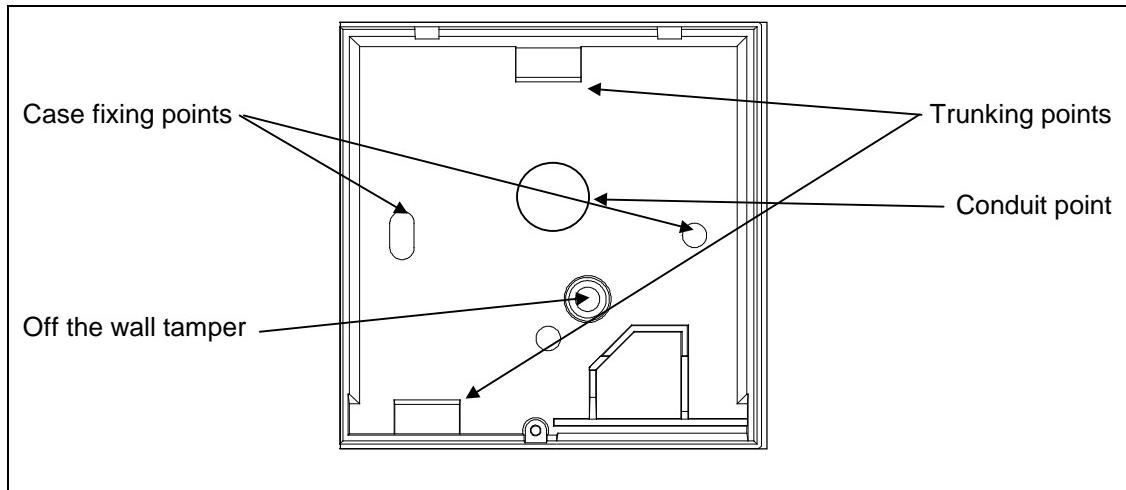
The connections shown on TB1 are for a Windsor 500 keypad. The order of connections on a Windsor mark 1 keypad is reversed. A Windsor 500 keypad can be identified by the backlit keypad and the circular electronic key socket.

User Interfaces**Keypoint**

The Windsor keypoint has backlit set and unset buttons, 4 status LEDs and an electronic key socket as standard. All keypoints are connected to Windsor on 4 wire UI bus.

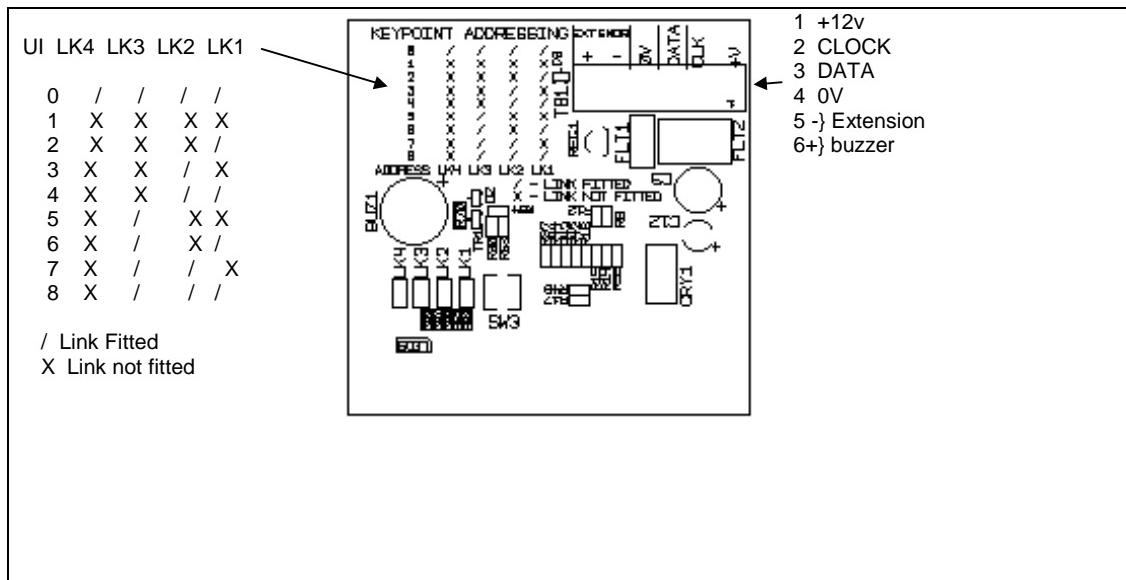
**Keypoint****Installation**

The keypoint should be fixed to the wall through using the fixing holes provided. If the off the wall tamper is being used then the tamper knockout should be removed prior to mounting the rear case.



Keypoint	Addressing
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All keypoints are identified by a unique address which is set using links on the keypoint PCB. The keypoint addresses must be in sequence from 1 up to the maximum number specified in the **System Size** programming option.

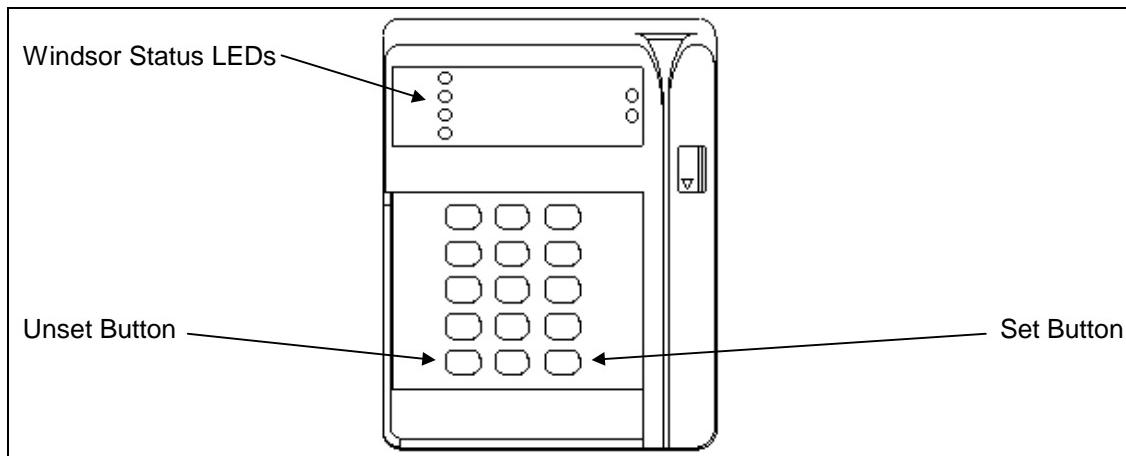


The connections shown on TB1 are for a Windsor 500 keypoint. The order of connections on a Windsor mark 1 keypoint is reversed. A Windsor 500 keypoint can be identified by the backlit keypad and the circular electronic key socket.

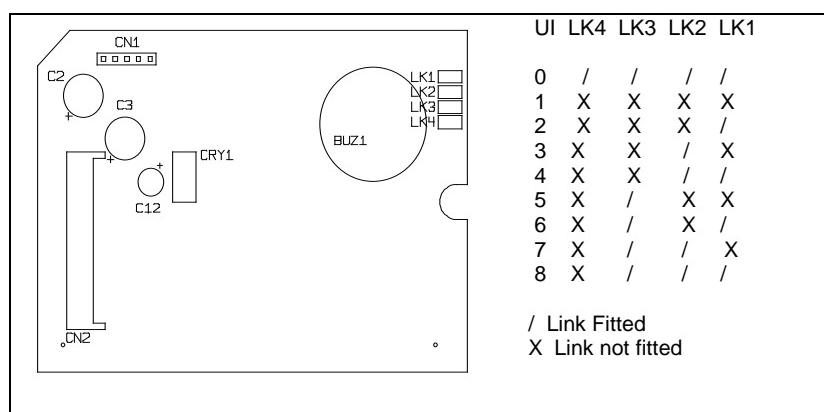
User Interfaces**Inova Cardpoint**

The INOVA Cardpoint has set and unset buttons and 4 status LEDs as standard. All Cardpoints are connected to Windsor on 4 wire UI bus. The Cardpoint can be used as a normal access control unit and to set and unset Windsor.

The normal guidelines for installing a standard Inova Access Controller should be followed. This section details additional connections and programming required to interface the Access Control Unit with the Alarm panel.

**Inova Cardpoint****Hardware****Inova Hardware****Addressing**

All Cardpoints are identified by a unique address which is set using links on the Cardpoint PCB. The Cardpoint addresses must be in sequence from 1 up to the maximum number specified in the **System Size** programming option.



Inova Hardware**Wiring Details**

Refer to wiring diagram (Main Circuit Board) on Inova Installation instructions.

1. On the main terminal block, terminals 1-4 should be connected to the control panel user interface bus (CON 9).

Terminal	1	+12V
Terminal	2	Clock
Terminal	3	Data
Terminal	4	0 v

2. Refer to detail B, Inova Installation Instructions (Door Strike Wiring). The power supply should be taken from one of the auxiliary power outputs on the Windsor main board (CON 21), or alternatively a separate PSU.

Inova Hardware**Relay Connections**

The alarm relay mimics the door contact at all times. Alarm and tamper can be wired to a convenient circuit on an internal or external concentrator. For BS4737 Installations, the circuit should be identified as an entry exit type (EnEx) for final door setting. If however, the Inova is outside the protected area, the circuit should be identified as a NA alarm type.

Inova Cardpoint**Programming**

The Inova Cardpoint unit is capable of interfacing with the Windsor Control Panel, enabling the user to set or unset the alarm system (similar to a normal keypoint), in addition to normal access control functions. Note, however, that the use of bank cards is precluded. All programming events are verified via red/green LED indicators.

Inova Programming**Adding / Deleting Alarm Users**

Specified users can be given authority to set or unset the alarm system. When you program an alarm card user Windsor will set the authority automatically to "Inova" which allows only set and unset. This authority can not be changed using a Windsor keypad or GuardStation.

Function	Command	Command Parameters
Add a new user	#31# aaaaa #ii#	aaaaa = the card number ii = the user number (3 to 40).
Delete a user	#33# aaaaa#.	aaaaa = the card number

If a new alarm card is assigned to an existing user number then the old user will be deleted automatically. It is not possible to add or delete an alarm card user if any area of the alarm system is set, or if the engineer is logged on.

Alarm Panel Interface Functions

Specified users will be able to set and unset the alarm panel. While the alarm system is set, access can be denied to all card holders until the panel is unset, or access can be permitted only to those users with authority to unset the alarm panel. The alarm LED's on the Inova unit (mains, ready, day and message) have the same meaning as those on a Windsor Keypoint.

Inova User Options**User Authority**

Two types of access card (visually identical but programmed differently) can be distributed to users.

Inova User Authority**Standard Access Card Operation**

Holders of valid standard access cards will have normal access when the system is unset, but will be unable to gain access when the alarm panel is set. If the system is set and access is denied, the red and green LED's will flash for five seconds indicating that the card is locked out. Additionally, the request to exit button/card swipe will deny exit when the system is set.

Inova User Authority**Alarm Card Operation**

Holders of valid alarm cards (maximum 38) have normal access functions, and additionally be able to set or unset the alarm system. When a valid alarm card is swiped (and PIN entered if required), the Cardpoint user is logged into the Windsor control panel for 15 seconds, during which time the existing alarm status may be altered. If the Cardpoint is programmed for instant set/unset the to unset the system, press the 'A' key. To set the system, press the 'C' key. If the Cardpoint is programmed for any other set mode then the programmed area(s) will be unset when the Cardpoint user logs on.

Inova Cardpoint**BS4737 Installation**

Some installations, in order to conform with BS4737 regulations, will have the INOVA controller located inside the protected area, linked to an auxiliary reader at the entrance.

Inova BS4737 Installation**Unsetting**

If the system is set, swiping an authorised alarm card at the auxiliary reader will grant access to the protected area. However, the user must then enter his or her PIN number at the INOVA controller inside the protected area within the programmed time (15, 20, 30, 45 or 60 seconds). This will log the user on to the alarm panel, whereby the system can be unset by pressing the 'A' key.

Inova BS4737 Installation**Setting**

To set the system, an authorised alarm card user should swipe the card at the INOVA controller, enter PIN code (to log onto the alarm system) and press the 'C' key. The user must then leave the protected area within the normal exit time, programmed at the control panel.

Note: For BS4737 Installations, normal access card plus pin operation is not available. However, an alarm card user must use his or her PIN code to log on to the control panel, when setting or unsetting the system. The command # 41 # 5 # has no effect.

Inova Cardpoint**Alarm Panel Restrictions**

The Windsor panel cannot be set whilst the door is open (alarm signal relay de-energised). If the INOVA is within the protected area, the alarm system should be set for 'timed exit', in order that the user may leave before the door automatically locks. An option is given (#61#3#) to configure the system such that the door will unlock automatically when the alarm system is unset. The alarm system, through the access controller, acts as the locking and unlocking mechanism for the entrance, allowing unrestricted access while the door panel is unset. The unlock maintained command may also be issued manually. The factory default is that unsetting the panel does not unlock the door.

Inova Cardpoint		Commands	
Command	Suffix	Description	LED Indication
Swipe Master Card	None	Enter learn mode	Red On Green On Slow alternating
# abcd #	None	Enter Programming mode in order to reset the reader (abcd is one of the two master reset codes)	Red quick flash Green Off
#00#	None	Exit Learn Mode/Exit Programming Mode	Red On Green Off
#14#	1#	Set door release time to 1 second	Red Off Green On (1 sec)
	2#	Set door release time to 5 seconds (default)	Red Off Green On (1sec)
	3#	Set door release time to 5 seconds	Red Off Green On (1sec)
	4#	Set door release time to 5 seconds	Red Off Green On (1sec)
#30#	nnnnn#	Add access card no. nnnnn	Red Off Green On (1sec)
#31#	aaaaa#ii#	Add alarm card no. aaaaa alarm panel identification no. (APIN). (1.99)	Red Off Green On (1sec)
#33#	ddddd#	Delete access or alarm card no. dddd	Red Off Green On (1sec)
#34#	nnnnn# mmmmm#	Add block of access cards nnnnn to mmmmm	Red Off Green On (1sec)
#37#	ddddd# eeeee#	Delete block of access cards from no. dddd to eeee	Red Off Green On (1sec)
#41#	2#	Lock Door Default	Red Off Green On (1sec)
	3#	Unlock door and maintain unlocked	Red Off Green On (1sec)
	4#	Unlock door momentarily	Red Off Green On (1sec)
	5#	Card + PIN mode	Red Off Green On (1sec)
	6#	Card Only mode (default)	Red Off Green On (1sec)
#58#	1#	Set entry time to 15 seconds	Red Off Green On (1sec)
	2#	Set entry time to 20 seconds	Red Off Green On (1sec)
	3#	Set entry time to 30 seconds	Red Off Green On (1sec)
	4#	Set entry time to 45 seconds	Red Off Green On (1sec)
	5#	Set entry time to 60 seconds	Red Off Green On (1sec)
#59#	1#	Access controller mounted inside controlled area as a reader (default)	Red Off Green On (1sec)
	2#	Access controller mounted outside controlled area as a request-to-enter reader	Red Off Green On (1sec)
#61#	0#	Set alarm relay to alarm shunt (default)	Red Off Green On (1sec)
	1#	Set alarm relay to alarm signal	Red Off Green On (1sec)
	2#	Normal access control mode (default)	Red Off Green On (1sec)
	3#	Unlock with Unset mode	Red Off Green On (1sec)
#98#	None	Delete all card numbers and reset to factory settings	Red Off Green On (1sec)

Concentrators

All detectors are connected to Windsor via a concentrator input. There are two types of concentrator; an internal concentrator which is plugged onto the main PCB and external concentrator which is connected to Windsor on a 4 wire bus. Internal concentrators can have 4 or 8 inputs. External concentrators always have 8 inputs. Internal and external concentrators can also be supplied with different input connections; end of line (EOL) or no end of line (NEOL) for the internal concentrator and EOL, NEOL or high security (HS) for the external concentrator. Internal and external concentrators have 2 programmable outputs and the external concentrator can be fitted with an optional 8 output daughter board.

Concentrator	Cable Length
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The maximum specified length of cable is calculated for a single concentrator and assumes that all detectors connected to the concentrator are always powered from a local auxiliary PSU.

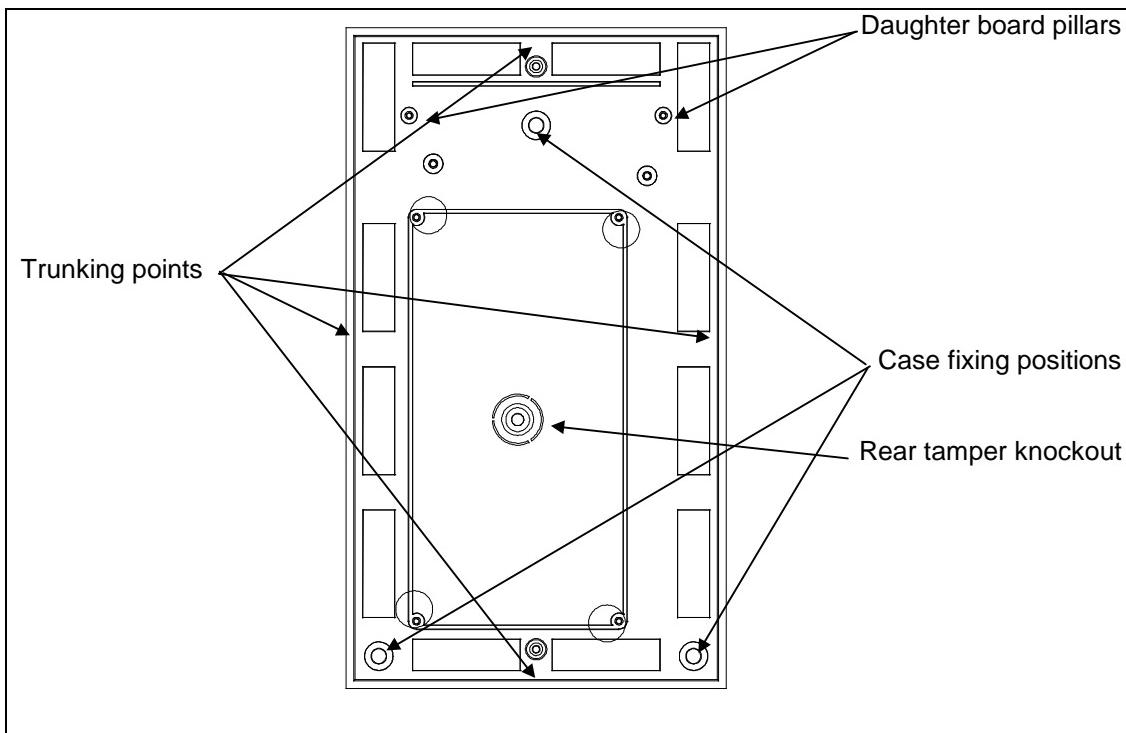
Maximum Concentrator Cable Length (m)		
Power Source	Un-screened Cable	Screened Cable
Control Panel	400 ¹⁰	400 ¹⁰
Local Aux. PSU	3000 ¹¹	2000 ¹¹

If auxiliary PSUs are used then all 0v connections must be connected to the control panel 0 volt terminal.

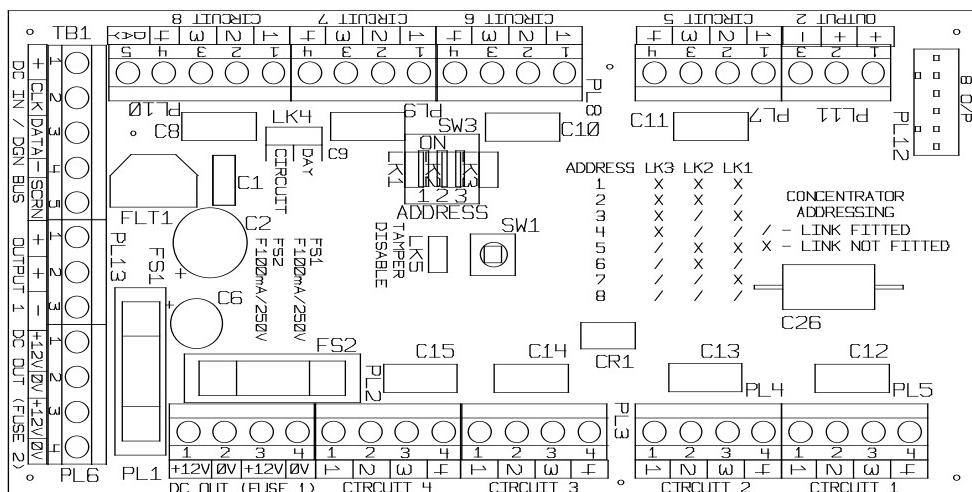
The installation information in the following section refers to the Windsor concentrator. The Vigil concentrator (EOL and HS types) can be identified by the DIL switch used for setting the concentrator address.

¹⁰ The maximum length of cable can be increased to 700m by using 2 cores for the positive and ground supply to the concentrators.

¹¹ These figures represent the absolute maximum cable length.

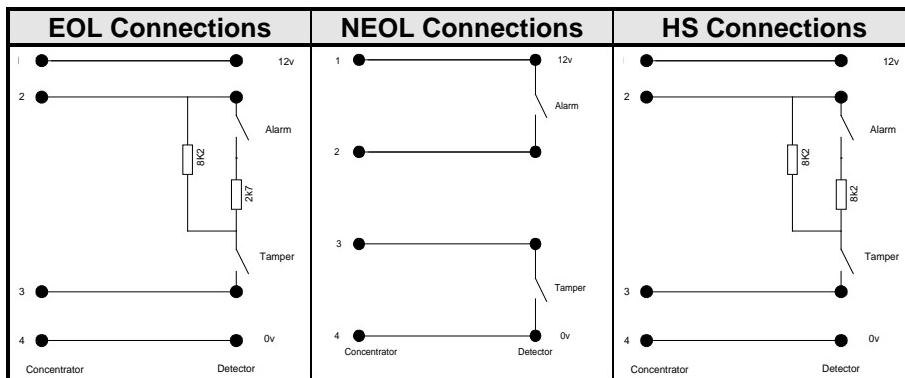
Concentrator**Installation****Concentrator****Addressing**

All concentrators are identified by a unique address which is set using links on the concentrator PCB. The concentrator addresses must be in sequence from 1 up to the maximum number specified in the **System Size** programming option. The total number of concentrators includes both internal and external types.



Concentrator**Connecting Sensors**

The concentrator connections for a sensor depends on the type of concentrator. The connections are the same for both internal and external concentrator types. HS concentrators are connected in the same way as an EOL type but both resistors are 8k2.



There are special connection requirements for an Excalibur sensor. Refer to the light control section of this manual for details.

Concentrator**PCB Links**

Link	Function	Comments
LK1-LK3	Address links	The concentrator addresses must be in sequence from 1 up to the maximum number specified in the System Size programming option.
LK4	Day/Detector Select	Selects the function of the circuit 8 input. If an Excalibur day sensor is connected to Windsor it must be connected to the DAY terminal of PL10 and LK4 must be in the day position. When LK4 is in the DAY position terminals 2/3 of PL10 cannot be used.
LK5	Tamper disable	Fit LK5 to disable the case tamper.

Concentrator**PCB Fuses**

Fuse	Type	Function
Fuse 1	F100 mA/250V	Aux. Power from PL1 and circuits 1-4
Fuse 2	F100 mA/250V	Aux. Power from PL6 and circuits 5-8

Concentrator**Connections**

Connector	Function	Terminals
TB1	Control Panel Bus	1 - 12v 2 - Clock 3 - Data 4 - 0v 5 - Screen (optional)
	<i>The screen terminal should be connected to earth.</i>	
PL1	Aux Power Output	1 - 12v 2 - 0v 3 - 12v 4 - 0v
	<i>Outputs supplied via fuse 1</i>	
PL2	Circuit 4	1 - 12v supplied from fuse 1 2 - detector input 3 - detector input 4 - 0v
	<i>Refer to diagram for EOL/NEOL connections.</i>	
PL3	Circuit 3	As PL2/Circuit 4 supplied from fuse 1
PL4	Circuit 2	As PL2/Circuit 4 supplied from fuse 1
PL5	Circuit 1	As PL2/Circuit 4 supplied from fuse 1
PL6	Aux Power Output	1 - 12v 2 - 0v 3 - 12v 4 - 0v
	<i>Outputs supplied via fuse 2</i>	
PL7	Circuit 5	As PL2/Circuit 4 supplied from fuse 2
PL8	Circuit 6	As PL2/Circuit 4 supplied from fuse 2
PL9	Circuit 7	As PL2/Circuit 4 supplied from fuse 2
PL10	Circuit 8	1 - 12v supplied from fuse 2 2 - detector input 3 - detector input 4 - 0v 5 - Day sensor input
	<i>Refer to diagram for EOL/NEOL connections. Day input is for use with an Excalibur sensor. LK4 must be in the day position if day input is used.</i>	
PL11	Output 2	1 - +ve output 2 - +ve output 3 - -ve output
	<i>Output function is software programmable. Refer to diagram for connections.</i>	
PL12	Output 3	8 output programmable daughter board
PL13	Output 1	1 - +ve output 2 - +ve output 3 - -ve output
	<i>Output function is software programmable. Refer to diagram for connections.</i>	

Vigil Concentrator

The Vigil concentrator operates in the same way as a Windsor concentrator. The main difference is that a Vigil concentrator, when used in a Windsor system, can be addressed up to concentrator 16. The connections to the Vigil concentrator are also different and are explained in the following section. The Vigil concentrator (EOL and HS types) can be identified by the DIL switch used for setting the concentrator address.

Vigil Concentrator	Connections
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A Vigil concentrator is connected to Windsor in the same way as a Windsor concentrator but the connection order is different as shown below.

Connector	Function	Terminals
TB1	Control Panel Bus	1 - 12v
		2 - 0v
		3 - Data
		4 - Clock

Vigil Concentrator	Outputs
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A Vigil concentrator has 3 outputs (PL9, PL10 and PL11). When used in a Windsor system PL9 cannot be used. The other 2 outputs can be programmed as output 1 and output 2.

Windsor	Vigil	Connections
O/P1	PL10	PL10/1 -12v PL10/2 - output
O/P2	PL11	PL11/1-4 - common output

The concentrator daughter board functions are the same on a Vigil concentrator and is programmed as output 3.

Vigil Concentrator	Address Selection
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The Vigil concentrator address is set using a DIL switch. The address table shows the DIL switch positions when using a Vigil concentrator in a Windsor system

Windsor Address	DIL Switches 5 4 3 2 1 0
Concentrator 1	0 0 0 0 0 0
Concentrator 2	0 0 0 0 1 0
Concentrator 3	0 0 0 1 0 0
Concentrator 4	0 0 0 1 1 0
Concentrator 5	0 0 1 0 0 0
Concentrator 6	0 0 1 0 1 0
Concentrator 7	0 0 1 1 0 0
Concentrator 8	0 0 1 1 1 0
Concentrator 9	0 1 0 0 0 0
Concentrator 10	0 1 0 0 1 0
Concentrator 11	0 1 0 1 0 0
Concentrator 12	0 1 0 1 1 0
Concentrator 13	0 1 1 0 0 0
Concentrator 14	0 1 1 0 1 0
Concentrator 15	0 1 1 1 0 0
Concentrator 16	0 1 1 1 1 0

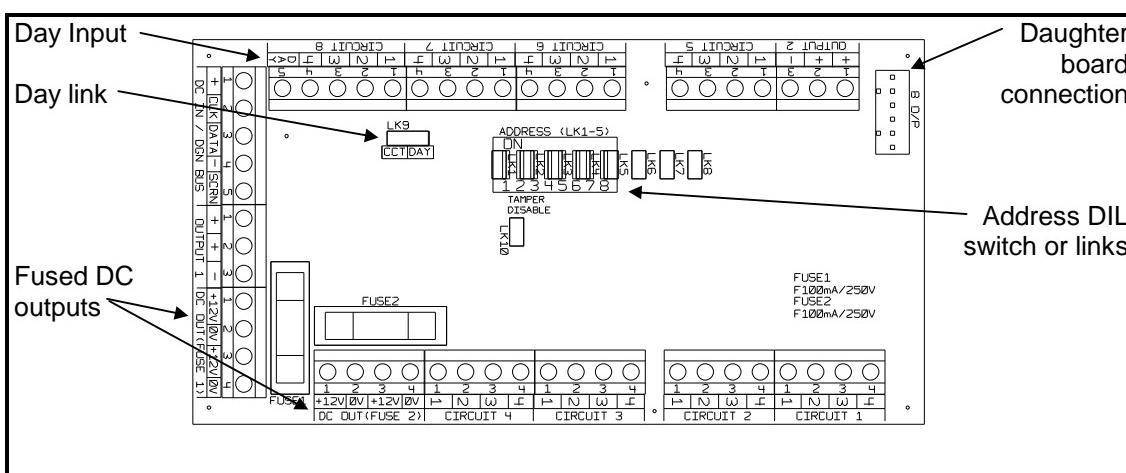
HS Concentrator

The HS concentrator is functionally equivalent to the existing "Vigil" concentrator and may be used in a Windsor 500 or 700 system. The maximum concentrator address is 32 which allows systems of up to 256 circuits to be configured. On a Windsor 500 the maximum number of circuits is 128.

The HS concentrator PCB is supplied either in a Windsor 500 concentrator plastic case (white plastic with screw on lid) or in a metal case. The HS spare PCB may also be fitted into a Vigil case.

HS Concentrator

PCB Layout



HS Concentrator

Address Selection

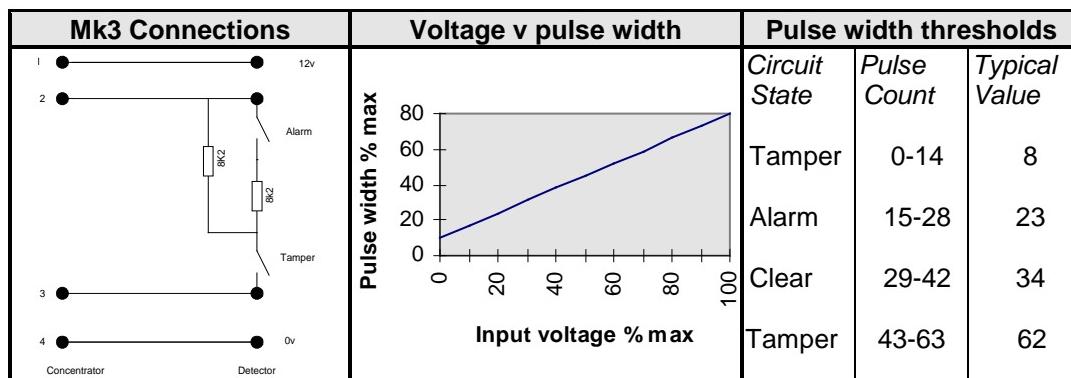
The HS concentrator address is set using either a DIL switch or PCB links. The address table shows the DIL switch positions and the Windsor addresses.

Windsor 500 Address	Address Links 5 4 3 2 1
Concentrator 1	x x x x x
Concentrator 2	x x x x ✓
Concentrator 3	x x x ✓ x
Concentrator 4	x x x ✓ ✓
Concentrator 5	x x ✓ x x
Concentrator 6	x x ✓ x ✓
Concentrator 7	x x ✓ ✓ x
Concentrator 8	x x ✓ ✓ ✓
Concentrator 9	x ✓ x x x
Concentrator 10	x ✓ x x ✓
Concentrator 11	x ✓ x ✓ x
Concentrator 12	x ✓ x ✓ ✓
Concentrator 13	x ✓ ✓ x x
Concentrator 14	x ✓ ✓ x ✓
Concentrator 15	x ✓ ✓ ✓ x
Concentrator 16	x ✓ ✓ ✓ ✓

✓ = link fitted, x = link not fitted

HS Concentrator**Connecting Sensors**

On a HS concentrator the sensors are connected in the same way as an EOL type but both resistors are 8k2.



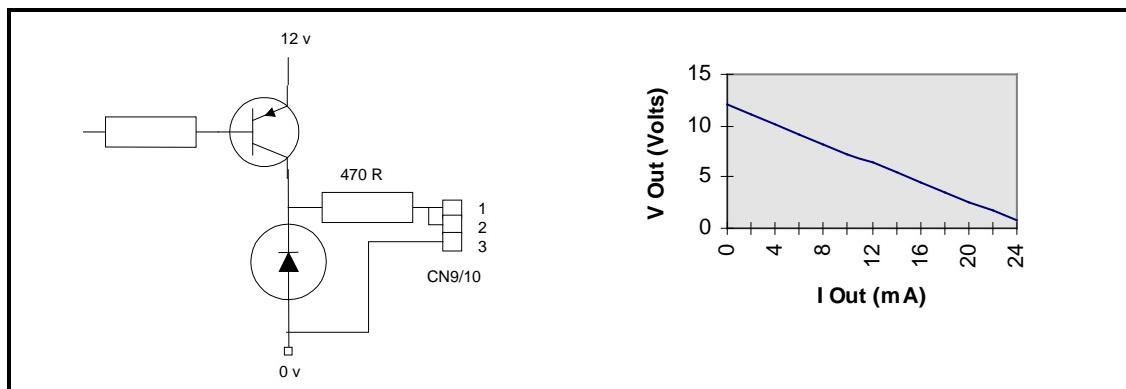
A pulse width of 0 indicates either a concentrator address error or that the circuit is Off. A pulse width of 63 indicates that the data line is permanently high and that the concentrator wiring should be checked.

HS Concentrator**PCB Fuses**

Fuse	Type	Function
Fuse 1	F100 mA/250V	Aux. Power from CN12 and circuits 5-8
Fuse 2	F100 mA/250V	Aux. Power from CN11 and circuits 1-4

HS Concentrator**PCB Links**

Link	Function
6	Fitted - Outputs debounced
7	Fitted - Output 1 mimics O/P 3 (daughter board) channel 1, Not Fitted - normal operation, as programmed for O/P 1
8	Fitted - Excalibur day sensor connected to circuit 8 (see also LK9).
9	Day/circuit select for circuit 8 input
10	Fitted - Lid & rear tamper Disable

HS Concentrator**Outputs 1 & 2**

HS Concentrator**Connections**

Connector	Function	Terminals
TB1	Control Panel Bus	1 - 12v 2 - Clock 3 - Data 4 - 0v 5 - Screen (optional)
	<i>The screen terminal should be connected to earth.</i>	
CN12	Aux Power Output	1 - 12v 2 - 0v 3 - 12v 4 - 0v
	<i>Outputs supplied via fuse 1</i>	
CN4	Circuit 4	1 - 12v supplied from fuse 2 2 - detector input 3 - detector input 4 - 0v
CN3	Circuit 3	As CN4/Circuit 4 supplied from fuse 2
CN2	Circuit 2	As CN4/Circuit 4 supplied from fuse 2
CN1	Circuit 1	As CN4/Circuit 4 supplied from fuse 2
CN11	Aux Power Output	1 - 12v 2 - 0v 3 - 12v 4 - 0v
	<i>Outputs supplied via fuse 2</i>	
CN5	Circuit 5	As CN4/Circuit 4 supplied from fuse 1
CN6	Circuit 6	As CN4/Circuit 4 supplied from fuse 1
CN7	Circuit 7	As CN4/Circuit 4 supplied from fuse 1
CN8	Circuit 8	1 - 12v supplied from fuse 1 2 - detector input 3 - detector input 4 - 0v <i>Day input is for use with an Excalibur sensor. LK8 must be in the day position if day input is used.</i> 5 - Day sensor input
CN9	Output 2	1 - +ve output 2 - +ve output 3 - -ve output
	<i>Output function is software programmable. Refer to diagram for connections.</i>	
PL1		8 output programmable daughter board
CN10	Output 1	1 - +ve output 2 - +ve output 3 - -ve output
	<i>Output function is software programmable. Refer to diagram for connections.</i>	

Internal Serial Bus

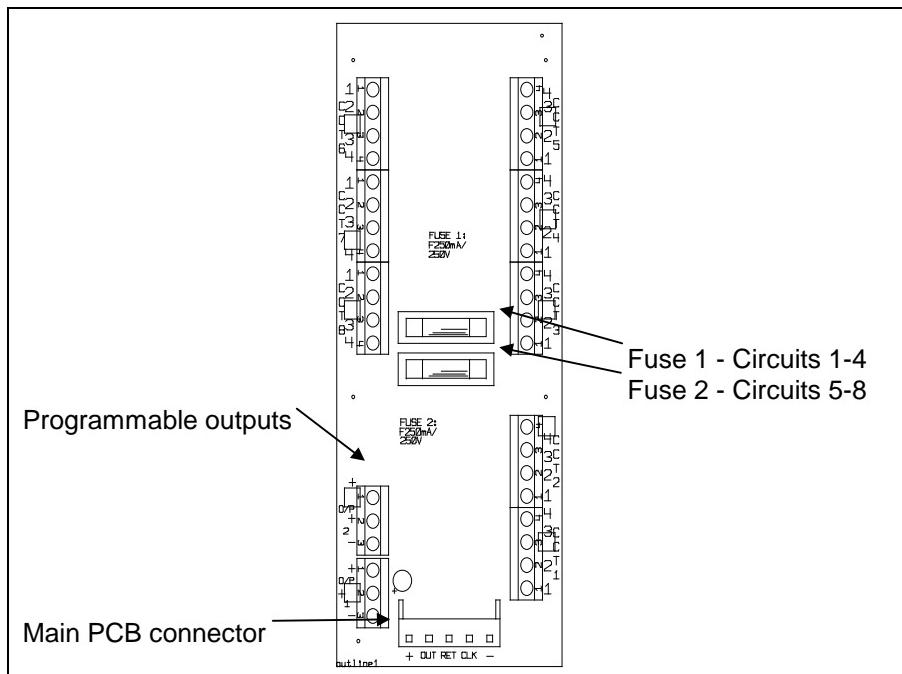
The Windsor internal serial bus (ISB) can have up to 4 optional PCBs fitted. The Optional PCBs are either;

- SmartDial/SmartDial Plus
- 8 circuit Concentrator
- 8 channel TX or relay card
- AV60 audio verification card

When an ISB option board is fitted the ISB link on the main PCB must be moved to the appropriate position. If this link is fitted incorrectly then all ISB option boards and all keypads will not function.

Internal Serial Bus	Concentrator
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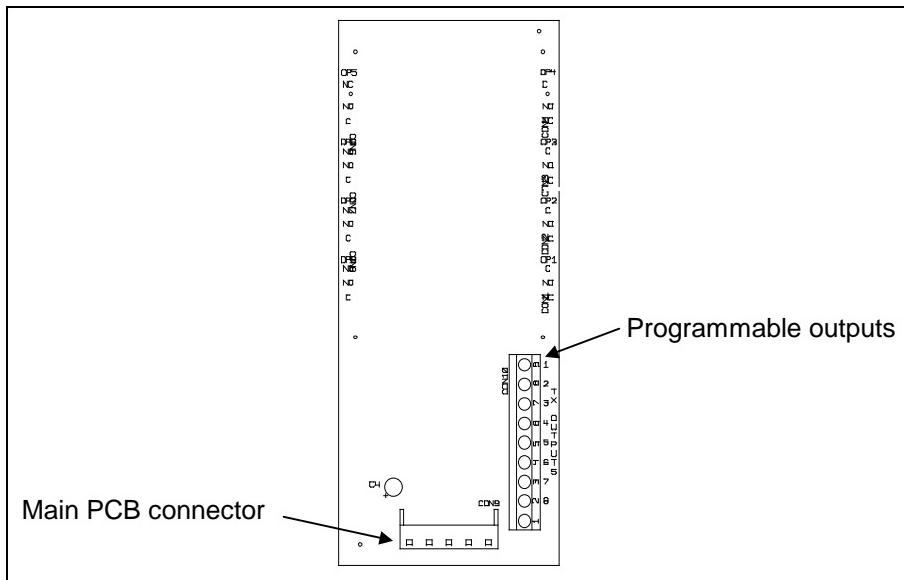
The concentrator connections are shown below with all terminations. End of Line (EOL) and No end of line (NEOL) ISB concentrator variants are available. The circuit connections are identical to the circuit connections of an external concentrator of the same type. The address of an ISB concentrator is programmed from a keypad in the Hardware/ISB menu option. The address can be programmed in the range 1 up to the maximum specified in the System size programming option.



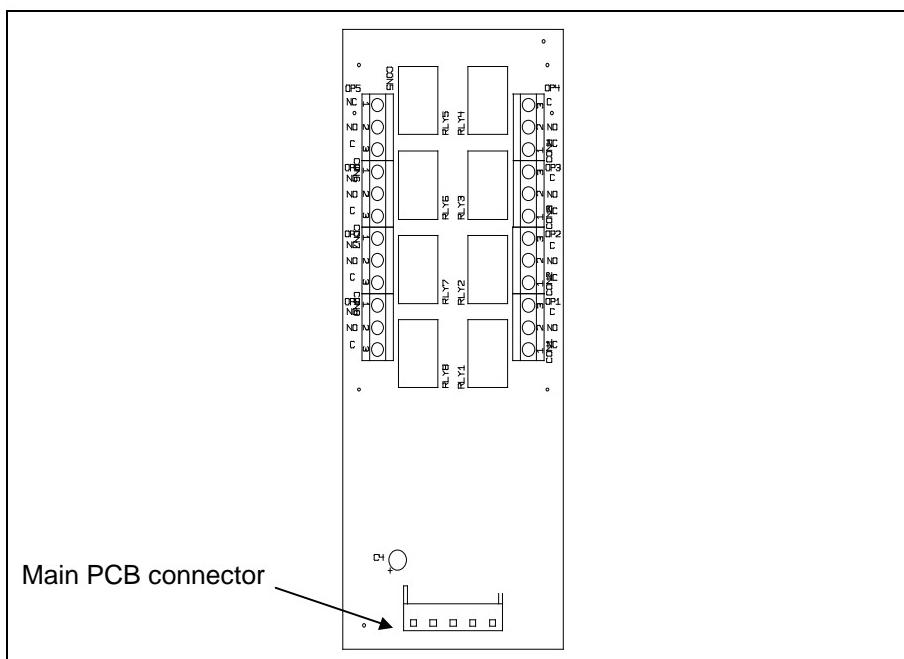
Connector	Terminals
Circuit 1-8	1 - 12v 2 - detector input 3 - detector input 4 - 0v
<i>Refer to diagram for EOL/NEOL connections.</i>	
Output 1-2	1 - +ve output <i>Output function is software programmable.</i> <i>Refer to diagram for connections.</i>
	2 - +ve output 3 - -ve output

Internal Serial Bus**TX Card**

The Windsor ISB TX card has 8 programmable outputs. The default polarity is positive removed but this can be inverted in software.

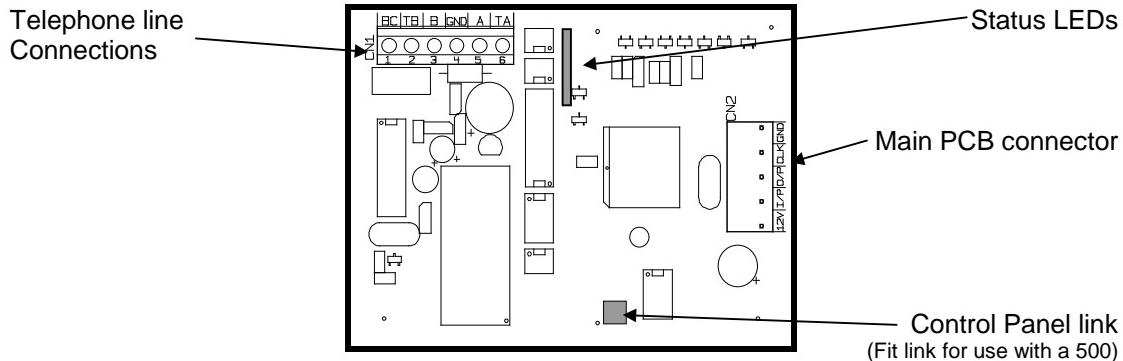
**Internal Serial Bus****Relay Card**

The Windsor Relay card has 8 programmable outputs. The default polarity is positive removed but this can be inverted in software. Each output has a NO and NC contact.



Internal Serial Bus**SmartDial**

SmartDial is a combined dialler/modem which connects to Windsor on the internal serial bus. SmartDial is fully programmable from a Windsor keypad and can share a telephone line with a telephone handset(s). Refer to the SmartDial instructions for the telephone line connections and features. The PCB layout shown is for a SmartDial/SmartDial Plus but the terminals are in the same position in a SmartDial Super.

**SmartDial Super****Approvals**

Country	Approval Number
Belgium	TBA
UK	503921
Eire	DOC 108/96
France	TBA
Italy	TBA
Netherlands	961485

SmartDial**LED Status Indicators**

SmartDial Super has 3 status LEDs. There are no status LEDs on SmartDial/SmartDial Plus.

Function	Green Line Stat	Red Hook	Orange Call Prog
Exchange Line Voltage OK	On		
Insufficient Exchange Line Voltage	Off		
On line (off hook)		On	
Off line (on hook)		Off	
Line activity		On	Flash
Idle status (every 6 secs)		Off	Flash
Ringing detected (version 2.07 or later only)	Flash		Flash
SmartDial reset (version 2.07 or later only)	Alternate flash		Alternate flash
Data transmit(version 2.07 or later only)	On		Flash

SmartDial**Panel Selection**

SmartDial Super is a universal product, interchangeable on all Windsor panel variants by a simple link selection.

- LK1 = Removed for Windsor 300 panels
- LK1 = Fitted for Windsor 500 and 700 panels

SmartDial**Features****SmartDial Features****Exchange Voltage Monitoring**

As a protection against a cut line or telephone line fault, the nominal supply voltage from the telephone exchange is continuously monitored. If a fault condition occurs for more than approximately 5 seconds, the control panel is informed of the *loss of line* condition. When the line is restored, the panel is informed after approximately 5 seconds.

The Windsor control panel will only indicate a line fault if the fault is present continuously for 45 seconds.

If SmartDial has an attached telephone handset, then a *loss of line* condition exists whenever the handset is in use. In this case Windsor must be programmed with the **Handset** option selected, to disable *loss of line* reporting back to the panel.

When the system is set (all areas), *loss of line* will be reported back to the panel regardless of whether the **Handset** option is programmed.

SmartDial Features**Line Blocked Detection**

In some circumstances the exchange voltage may be present but no proceed indication (dial tone) exists. For example:

- when the telephone exchange has removed outgoing service
- when an incoming caller has not released the line and effectively blocked outgoing calls
- when an out of service tone is present

SmartDial can be programmed to periodically test for line blocked (every hour) and report any problem to the panel. When the line blocked condition clears, SmartDial will report this back to the panel after approximately 10 seconds. SmartDial checks the line by looking for the dial tone, dialling the first digit of the first programmed telephone numbers and ensuring that the dial tone is removed.

If the **Handset** option is programmed **Line blocked** will only be reported when the system is set (all areas).

SmartDial Features**Series Handset Disconnect**

Provision has been made to allow for connection of up to three telephone handsets on the same telephone line as SmartDial. These handsets **must** be connected in series, with SmartDial the **first** apparatus connected to the master telephone socket. Connection of SmartDial and telephone handsets are made via connector CN1 on the network side of the PCB and the protective cover moulding must be fitted after connection to the PSTN.

When any handset is attached, the communicator must be programmed so that it is made aware of such an attachment. This avoids having the *loss of line* conditions reported when the handset is in use, causing line fault transmissions to the central station.

If **Handset** and **Line blocked** are both programmed then line blocked and exchange voltage monitoring will only be reported to the panel when the system (all areas) is set.

Connecting handsets in any configuration other than the method stated above (such as parallel connection) will invalidate BABT (UK PTT) approval.

SmartDial Features	DTMF and Pulse dial
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The communicator is capable of both DTMF and Pulse (loop disconnect) dialling of the programmed telephone numbers. Dialling will only commence in the presence of a valid proceed indication (dial tone) and will employ **Timed Break Recall** after 5 seconds in the absence of the dial tone. If the exchange still fails to provide a dial tone, SmartDial will release the line after a further 5 seconds. This will be considered as a connection attempt.

SmartDial Features	Timed Break Recall
--------------------	--------------------

The Timed Break Recall ("Star Services" in UK) service available on digital exchanges in many countries is employed at the dial time if no dial tone is detected. This action requests a clear fresh line from the exchange and overcomes the malicious, or otherwise, blocking of the telephone line. This feature is a programmable option in v2.07 or later. Note that the panel software must be 2.07 or later.

SmartDial Features	Compatibility with BT Redcare
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SmartDial can be successfully used on BT Redcare lines due to the filtering out of the STU low frequency tone at the SmartDial telephone line input.

SmartDial Features	Locally Initiated Test Calls
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A test call is initiated to the primary, secondary and dual reporting telephone numbers in turn, in the format programmed for that telephone store. The result of test calls are entered into the event log. Test calls in Ademco format will be signalled using the text channel (channel 9) and will include the current status for channels 1-8.

SmartDial Features	Default Configuration
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The contents of the SmartDial configuration can be defaulted to a known state by defaulting the Windsor configuration.

SmartDial Features	Blind Dial
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Normally the communicator will only dial if a valid dial tone is detected. In some circumstances, such as dialling through a PABX or where the telephone exchange tones are not reliable, it may be necessary to program the communicator to dial without recognising a dial tone. This feature is a programmable option in v2.07 or later. Note that the panel software also be 2.07 or later.

SmartDial**Alarm Protocols****SmartDial Protocols****Fast Format Alarm Reporting**

In the fast format alarm format alarm data is represented by 8 channels. When any channel changes state, the communicator is triggered to initiate a call to the programmed central station. Each channel can assume one of six states;

- No Alarm (Code 5)
- New Alarm (Code 1)
- Continuing Alarm (Code 6)
- Alarm Restore (Code 3)
- New Opening (Code 2)
- New Closing (Code 4)

The manner in which the transitions between these states are reported to the Central Station is dependent upon how the communicator is programmed to respond. The actual meaning given to each channel is known only to the panel and the central station.

Alarm and restore events are reported to the programmed central station using the protocol defined in the draft IEC publication 839 part 8 - "DTMF protocol for use in Digital Communicator Systems at Interfaces with the PSTN". The protocol types supported are as follows;

- 4-8-1/1 4 digit ID, 8 digit channel data , 1 digit status - handshake type 1
- 4-8-1/2 4 digit ID, 8 digit channel data , 1 digit status - handshake type 2

SmartDial Protocols**Superfast Format**

This is an enhancement to the standard fast format reporting and is user selectable as a programmed option. The standard fast format protocol at the central station receiver requires to see two identical messages before it accepts the message as valid (a basic method of error detection). The Superfast format sends the message only once, and relies on its error detection, on the appending of a suitable checksum digit to the message. This offers both time and communication cost savings.

SmartDial Protocols**Restore Codes**

When any channel goes into alarm the communicator will always initiate an alarm report call. Normally, the transition from alarm to restore is ignored by the communicator. However, any channel(s) programmed for restore reporting will report the restore condition.

SmartDial Protocols**Open/Close Codes**

Not all of the 8 channels necessarily represent alarm data. Any of the 8 channels may be programmed to report a modified code. The alarm receiver will interpret **close** instead of **alarm** and **open** instead of **restore** for these channels. Selection of Open/Close will override selection of Alarm and Restore Reporting.

The eight channels can be programmed in any combination of Alarm Only, Alarm/Restore and Open/Close code reporting.

SmartDial Protocols**Point ID Reporting**

This is an alarm reporting protocol which allows additional data to be transmitted to the central station without resorting to a modem format. It uses DTMF transmission with a message content significantly different from standard fast format protocols.

With normal alarm reporting, a single alarm code is transmitted to the central station when one or several circuits have been triggered. This method does not pinpoint the active circuit. With Point ID each circuit will be uniquely identified thus aiding the police to investigate the sources of alarms.

A list of supported Point ID codes is provided in the Windsor control panel manual.

SmartDial Protocols**Guardall Alarm Format**

It is possible to send alarm reports using the Guardall format to a MAS equipped central station or a GuardStation system. This is a modem format which offers many advantages over standard alarm messages. Alarm data is sent in the form of an ASCII string containing the date, time, event identifier and event status.

SmartDial Protocols**Paging Reports**

SmartDial can be programmed to report alarm events to a remote hand held radio pager. In the UK paging formats supported are Mercury and Vodapage, and can send information in either Direct Numeric or Stored Message Mode.

- Direct Numeric : Message is received as follows : (4 digit site ID) + (1 digit Ademco Event) + (1 digit Channel in Alarm).
- Stored Message : This allows a more descriptive message to be received, but cannot display the site ID. The channel in alarm is transmitted to the pager where one of the six pre-programmed text descriptions is displayed, for example, FIRE or BURGLARY.

SmartDial Protocols**Primary/Secondary Reporting**

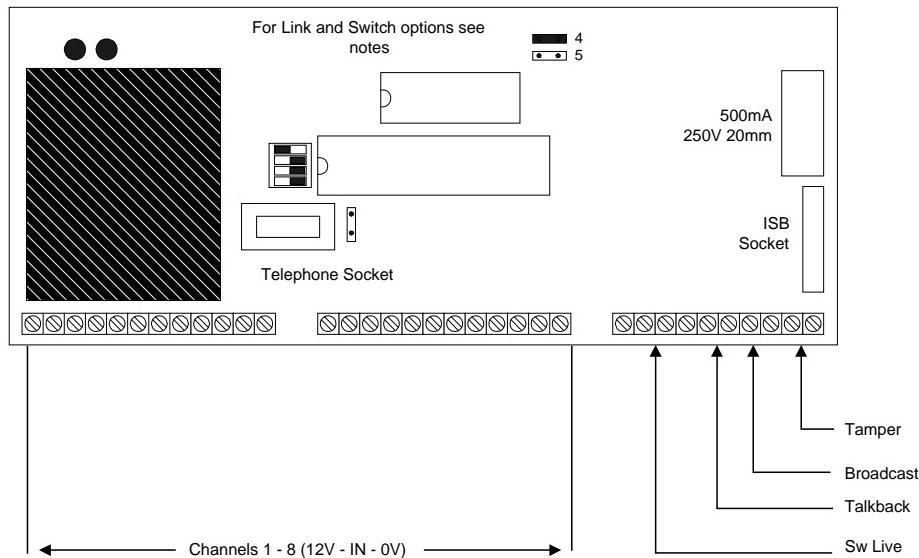
SmartDial will make up to 3 connect attempts to call the receiver at the Primary Telephone number in the configuration store. If all these attempts fail, and if a telephone number has been entered in the Secondary Number Store, it will then make up to 3 attempts to call the receiver at the Secondary Telephone number. If all these attempts fail, then the communications failure status is sent to the panel. As soon as a receiver is contacted, and all the outstanding alarms sent, then the sequence is halted. If a message is successfully transmitted then **Comms OK** is reported to the panel.

SmartDial Protocols**Dual Reporting**

SmartDial will make up to 3 connect attempts to call the receiver at the Primary Telephone number. As soon as an attempt is successful, or all attempts fail, then it will then make up to 3 attempts to call the receiver at the Dual Telephone number, if a Dual number has been defined. When both receivers have been contacted, and all outstanding alarms sent to both, then the sequence is halted.

SmartDial Protocols**Downloading**

SmartDial Plus and Super can be used to remotely control Windsor and to transfer the configuration and event log. These features are only available if you use the GuardStation PC software with a V23 half duplex modem. Refer to the GuardStation manual for full details.

Internal Serial Bus**AV60****AV60****Connections**

Connection	Function
Audio 1-8	12v, +ve feed to microphone IN Audio connection to microphone 0v, -ve feed to microphone
SW Live	LED enable to microphone (common for all microphones)
Talkback	Audio to Talkback unit
Broadcast	Audio to Broadcast unit
Tamper	tamper connections for all microphones

AV60**Switch Options**

Switch	Off	On
1	Pre-record audio (jumper 4 in)	Record from alarm (jumper 4 out)
2	Star services disabled	Star services enabled
3	30 seconds record (jumper 5 out)	60 seconds record (jumper 5 in)
4	Live audio first	Recorded audio first then live

AV60**Programming**

Refer to the Edit/Hardware section of the Windsor programming manual.

AV60**Recording a Message**

To record the site message;

1. Connect a telephone handset with DTMF capability to the telephone socket of the AV60.
2. Press the * button on the handset.
3. Press 02 on the handset. The Green LED should come on. If the green LED does not come on then remove all connections from the IN terminals. and retry.
4. Record the site name and site ID (maximum of 6 seconds).
5. Press #3 to exit.

AV60**Access PIN Code**

To program the access PIN code;

1. Connect a telephone handset with DTMF capability to the telephone socket of the AV60.
2. Press #7 on the handset.
3. Enter the 4 digit access code.
4. Press * to terminate the access code.
5. Press #3 to exit.

If the control panel is de-powered the access PIN code must be re-entered.

AV60**Command Functions**

All commands from the alarm receiving centre are entered using a DTMF telephone handset.

Code	Function	Code	Function
*0	All channels on	*9	Auto sequence all channels
*1	Channel 1 on	#1	Replay stored audio
*2	Channel 2 on	#2	extend time by 2 minutes
*3	Channel 3 on	#3	shut down
*4	Channel 4 on	#7	enter passcode
*5	Channel 5 on	00	Talkback
*6	Channel 6 on	01	Broadcast
*7	Channel 7 on	02	Record site message
*8	Channel 8 on	03	Playback site message

AV60**Commissioning**

1. Check that the green LED on all microphones is flickering.
2. Set the alarm system. The red LED on all microphones should be on.
3. Cause an alarm.
4. The red LED on the AV60 PCB should be flashing.
5. Wait at least 30 seconds or until the red LED stops flashing and comes on continuously.
6. Dial the AV60 telephone number using a DTMF telephone handset.
7. On connection all sounders should be muted.
8. The AV60 will play back the site message and prompt for the access code.
9. Enter the programmed access code followed by *.
10. The AV60 will either play back the stored audio or switch to live audio.
11. Select each channel using the appropriate command.
12. Enter #3 to shut down the call.

Windsor Modem

There are 2 variants of the Windsor modem;

- W73535 Windsor 500/700 panel modem
- W73534 Windsor Receiver modem for GuardStation

There is only one version of the Windsor modem software for all target countries. The Windsor modem software has 3 pre-configured profiles which can be selected by using the ATZn command. The profile usage is shown in the table. The profile contents are detailed in the Windsor modem defaults section.

Command	Profile
ATZ1	Windsor 500, Windsor 700 version 8, Windsor modem Receiver.
ATZ2	Vigil V64 Mk2 panels using V23 mode
ATZ3	Vigil V64 Mk1a panels using V23 mode

Windsor Modem

Approvals

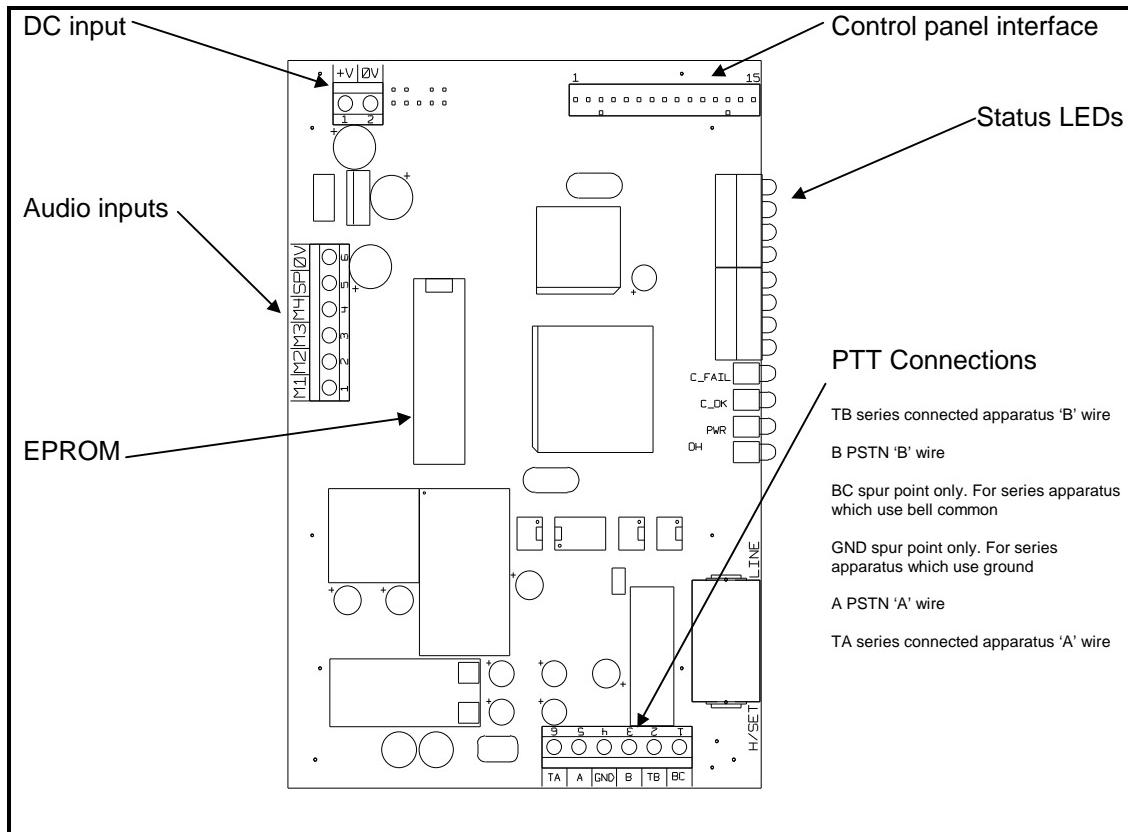
Country	Approval Number
UK	NS/3366/3/V/607064

Windsor Modem

PCB Connections

CN 3	Control Panel Interface	1 +12V 2 TXD 3 RXD 4 RTS 5 CTS 6 DTR 7 DSR 8 DCD 9 RI 10 ground 11 ground 12 No Connection 13 ground 14 ground 15 ground
CN2	Audio Interface (not supported at present)	1 microphone 1 2 microphone 2 3 microphone 3 4 microphone 4 5 speaker out 6 ground
CN9	PTT Connection	1 BC 2 TB 3 B 4 ground 5 A 6 TA
CN10	DC power	1 +12v 2 0v

The Windsor modem connects to the Windsor 500 or 700 with a ribbon cable. On a Windsor 500 it connects directly to the comms port without an RS232 interface adapter.



Windsor Modem

UK Telephone Network Connections

1. Windsor Modem Panel (W73535) and SmartDial Super (W73460)

Connection to the telephone network is made via the standard UK TE plug. The following connections to the modem terminal block are required.

Modem Terminal Block	TE PLUG (ref. BS6312 Part1)
BC	Blue - from pin 4 (if series equipment is to be connected)
TB	
B	Red - from pin 5
GND	Green - from pin 3 (if series equipment to be connected)
A	White - from pin 2
TA	

Figure 1.1

Ancillary apparatus (handsets, answer machines, etc.) can be connected in series with the modem by wiring the bare cables directly into the modem terminal block as shown in figure 1.1. Up to three ancillary apparatus can be connected in parallel with each other providing the REN of all equipment (including the modem) does not exceed 4 .

	Modem Terminal Block	Ancillary Equipment
BC	BC	Blue Wire of equipment (and blue from pin4 of TE PLUG)
TB	TB	Red Wire of equipment
B	B	
GND	GND	Green Wire of equipment (and green from pin4 of TE PLUG)
A	A	
TA	TA	White Wire of equipment

Figure 1.2

2. Windsor Modem Receiver (W73534)

Connection to the telephone network is made via the standard UK TE Plug. The following connections to the modem's RJ11 LINE socket are required, by using an RJ11 plug to standard UK TE Plug adapter (RJ11 sockets as viewed from above).

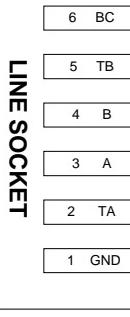
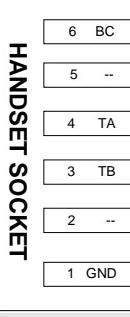
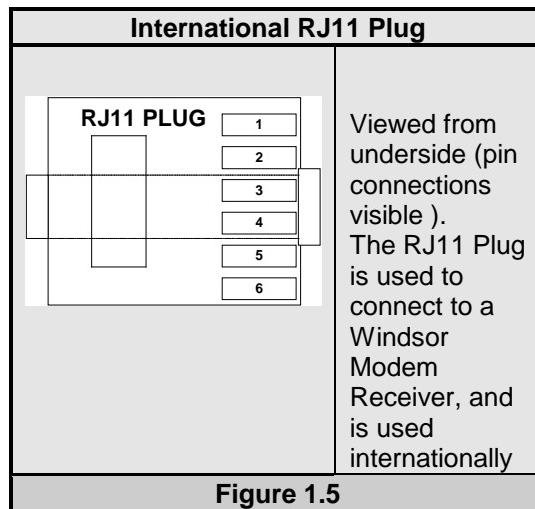
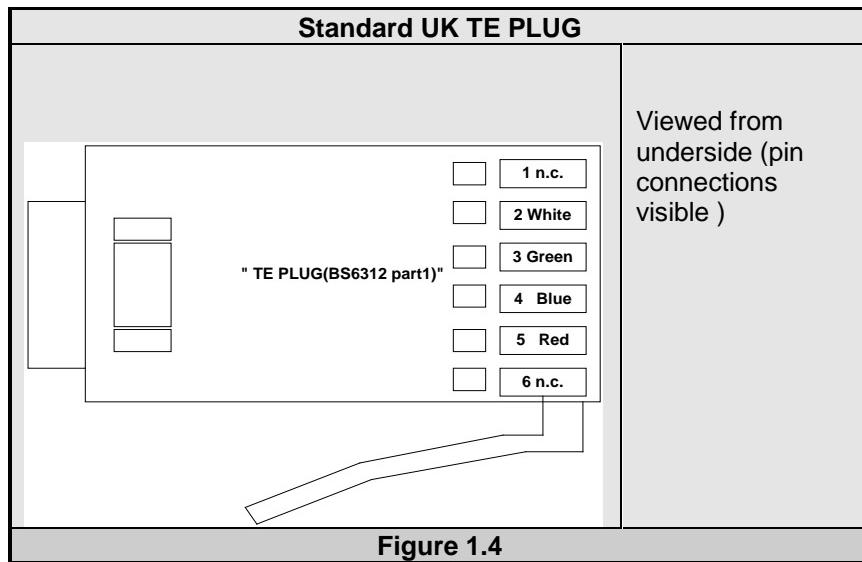
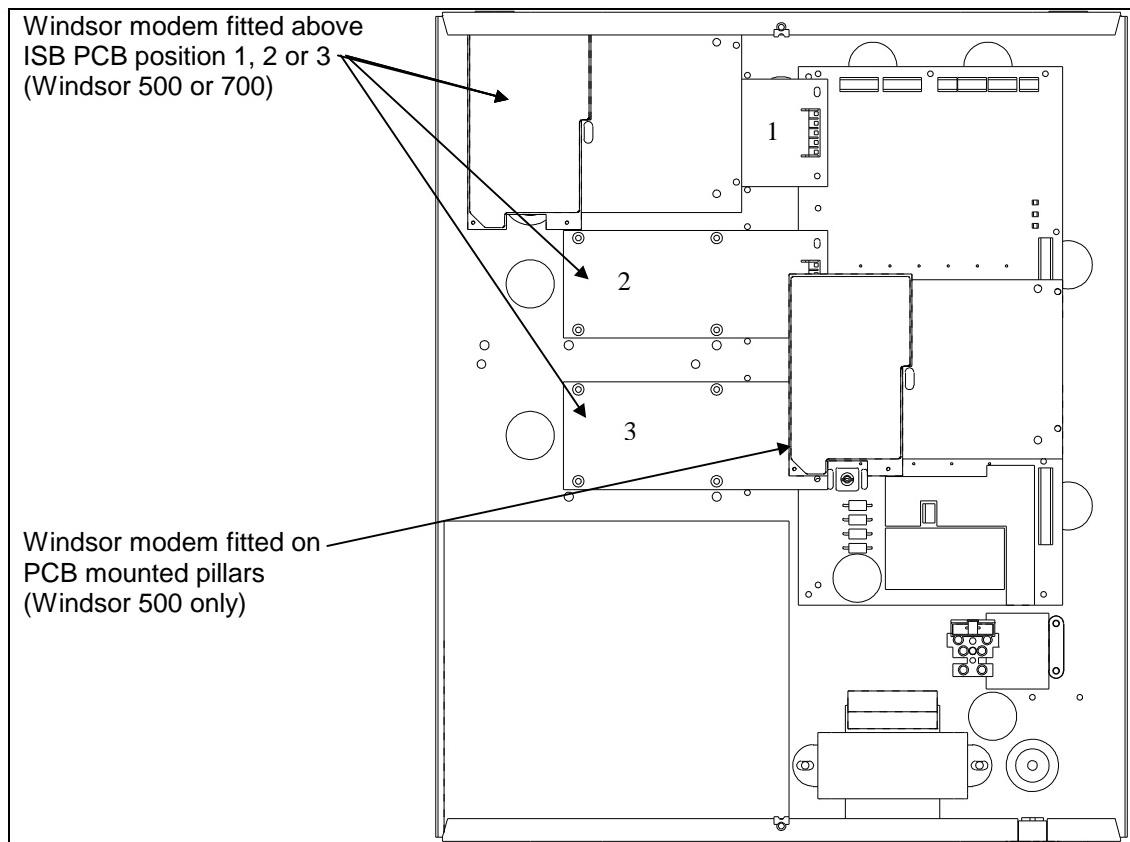
 LINE SOCKET	RJ11 PLUG	Standard UK TE Plug	Series equipment terminated in an RJ11 plug (figure 1.5) can be directly inserted into the modem's handset socket adapter is required for series apparatus fitted with a standard UK plug (figure 1.4). These can be purchased from any computer or telecomms wholesaler.
	Line BC	Blue - pin 4	
	Line TB	no connection	
	Line B	Red - pin 5	
	Line A	Blue - pin 2	
	Line TA	no connection	
 HANDSET SOCKET	RJ11 PLUG	Standard UK TE	
	Socket		
	HSET BC	Pin 4	
	HSET TA	Pin 2	
	HSET TB	Pin 5	
	HSET GND	Pin 3	

Figure 1.3



Windsor Modem**Mounting Positions**

The Windsor modem can be mounted in 2 ways in a Windsor 500; either on PCB mounted pillars or on above one of the ISB PCBs. In a Windsor 700 the modem can only be fitted above one of the ISB PCBs.

**Windsor Modem****Status LEDs**

LED Name	Variant	Function
DCD	RX only	Data Carrier Detect - on if carrier signal is detected from a remote modem.
RTS	RX only	Ready To Send - used with CTS to perform data flow control
DTR	RX only	Data Terminal Ready - on to indicate that the host is ready for data communications
RI	RX only	Ringing Indicator - ringing has been detected
DSR	RX only	Data Set Ready - on to indicate a connection to the telephone line
TXD	RX only	Transmit Data - data is being transmitted
RXD	RX only	Receive Data - data is being received.
CTS	RX only	Clear To Send - used with RTS to perform data flow control
Comm Fail	RX and panel	on continuous if a call attempt fails coincident with call progress tones
Comm OK	RX and panel	the last communication was successful and flashes rapidly during the power up sequence Exchange voltage is OK.
Power	RX and panel	DC power present
Off hook	RX and panel	modem is off hook
Comm Fail/OK	RX and panel	Rapid flashing indicates modem power up sequence

Windsor Modem Features**Call Attempts**

Country	UK	NL	IT	FRA	IRL	BEL	FIN	SA	AUS
Number of re-attempts	2	14	3	4	3	3	3	3	3
1st-2nd call attempt delay (seconds)	7	7	7	8	7	7	7	7	7
subsequent call attempts delay (seconds)	62	62	62	8	62	62	62	62	62

Windsor Modem Features**Exchange Voltage Monitoring**

As a protection against a cut line or telephone line fault, the nominal supply voltage from the telephone exchange is continuously monitored. The modem will detect a fault condition which is present for more than approximately 5 seconds.

Windsor Modem Features**Line Current Sensing**

If an attached telephone handset is in use, then a loss of line condition would normally be reported. The Windsor modem, however, can differentiate between a handset in use and a loss of line condition by sensing the line current. This allows the Windsor modem to share a line with other equipment and still retain continuous line monitoring.

Windsor Modem Features**Line Blocked Detection**

In some circumstances the exchange voltage may be present but no proceed indication (dial tone) exists. For example;

- when the telephone exchange has removed outgoing service
- when an incoming caller has not released the line and effectively blocked outgoing calls
- when an out of service tone is present

The Windsor Modem can periodically test for the line blocked condition. The Windsor modem checks the line by looking for the dial tone, dialling the first digit of the first programmed telephone numbers and ensuring that the dial tone is removed. Line block detection is a control panel feature. The modem will only check the line condition when the appropriate command is received from the panel.

Windsor Modem Features**Series Handset Disconnect**

Provision has been made to allow for connection of up to three telephone handsets on the same telephone line as the Windsor Modem. These handsets **must** be connected in series, with the Windsor Modem the **first** apparatus connected to the master telephone socket. Connection of the Windsor Modem and telephone handsets are made via connector CN1 on the network side of the PCB and the protective cover moulding must be fitted after connection to the PSTN.

When the handset(s) is disconnected there may be a delay, caused by the exchange, before a dial tone is present.

Connecting handsets in any configuration other than the method stated above (such as parallel connection) will invalidate national PTT approval.

Windsor Modem Features**DTMF and Pulse dial**

The communicator is capable of both DTMF and Pulse (loop disconnect) dialling of the programmed telephone numbers. Dialling will only commence in the presence of a valid proceed indication (dial tone) and may employ **Timed Break Recall**.

Windsor Modem Features**Timed Break Recall**

The Timed Break Recall ("Star Services" in UK) service available on digital exchanges in many countries is employed at the dial time if no dial tone is detected. This action requests a clear fresh line from the exchange and overcomes the malicious, or otherwise, blocking of the telephone line. Timed break recall is not available or necessary in France as the line blocking is not possible. Timed break recall can be disabled/enabled by using the AT&TBR command.

Windsor Modem Features**Redcare Compatibility**

The Windsor Modem can be successfully used on BT Redcare lines due to the filtering out of the STU low frequency tone at the Windsor Modem telephone line input.

Windsor Modem Features**Blind Dial**

Blind dialling (dialling without detecting a dial tone) is a programmable option. If the Windsor 500 is programmed for blind dialling the Windsor modem will go off hook and dial the within 3-5 seconds (country dependant). If a Windsor modem RX is being used the blind dialling option is programmed using the AT&BD command.

Windsor Modem Features**Double Calling**

When making a call to a panel which is sharing a telephone line with another automatic answering device, such as a FAX machine, the panel will normally be configured for double calling. The Windsor modem can instructed, using the ATDR command, to make a second call to a telephone number when ring back is detected. The second call is made after a delay of 5 seconds. The number of rings for the first call is programmable using the AT&D3 command. The default is 1 ring. If the panel communicator is a SmartDial Super fitted with software prior to version 2.7 then the number of rings should be changed to a minimum of 3.

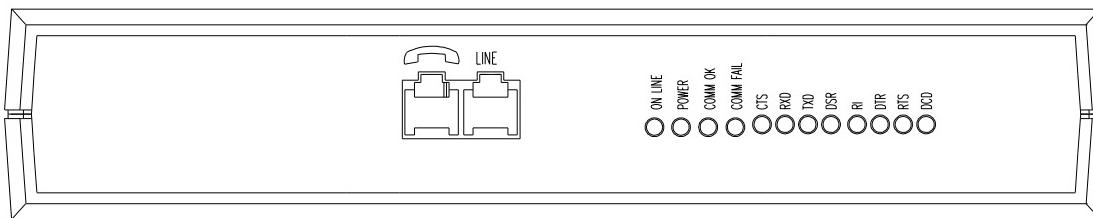
Windsor Modem	AT Commands	
Command	Modem action	Modem response
ATE0	*NO ACTION	OK
ATV1	*NO ACTION	OK
ATV0	*NO ACTION	OK
ATB0	Adaptive call originate/answer and return to 2400 baud command mode	OK or ERROR
ATB1	Force V23 HDX and return to 2400 baud command mode 1200 & 300 baud FSK can be achieved using the %B command (default)	OK or ERROR
ATB2	Force V23 HDX and return to 1200 baud command mode 1200 & 300 baud FSK can be achieved using the %B command	OK or ERROR
AT%B1	Set serial port to 1200 bps	OK or ERROR
AT%B2	Set serial port to 2400 bps	OK or ERROR
AT%B3	Set serial port to 300 bps	OK or ERROR
ATL0	Speaker always off	OK or ERROR
ATL1	Speaker high volume (default)	OK or ERROR
ATL2	Speaker Medium volume	OK or ERROR
ATL3	Speaker Low volume	OK or ERROR
ATM0	Speaker always enabled	OK or ERROR
ATM1	Speaker always enabled until connection established	OK or ERROR
ATD	Dial Command; Dial modifier = (comma), pause before dialling next digit, for example "ATD9,3335377<cr>"	BUSY or ERROR or NO DIAL TONE
ATP	Set dialling mode to Pulse	OK or ERROR
ATT	Set dialling mode to Tone	OK or ERROR
ATA	Answer ring signal	CONNECT (xxxx) or NO CARRIER
ATH0	Unconditional hang-up	OK or ERROR
ATH1	Go off hook but no dialling	OK or ERROR
ATI	Report software version, for example, "01:02"	01:02
AT&ST	Read Windsor Modem Status - V?L?H? where; V? - Vy = exchange voltage present - Vn = no exchange voltage L? - Ld = line block checking disabled (LB timer interval = 0) - Ln = line clear - Ly = line blocked H? - Hy = series handset currently in use - Hn = series handset not in use	returns 6 digit status or ERROR
AT&LB=xxxx	set line block check frequency (0-65535 minutes)	OK or ERROR
AT&LB?	read line block check frequency	OK or ERROR
AT&LBC	perform a line block check	ERROR or LINE BLOCKED or LINE CLEAR or NO 50V
AT&CNnnn	Set country code, nnn= 44 (UK) by default	OK or ERROR
AT&RFxxx\r	Set alarm reporting format; 0 : Normal modem mode 1 : ADEMCO Fast Format	

Command	Modem action	Modem response
	2 : ADEMCO Contact ID 9 : ADEMCO Superfast	
ATDRxxxx\r	Dial telephone number with double call timer enabled.	
AT&D3	Program the number of rings on first call attempt when using the ATDR option (default = 1)	
AT&RI	1 - Report double ring burst as a single ring 0 - RI follows the ringing cadence (default)	
AT&CD	1 - DCD will follow the state of DTR irrespective of the carrier 0 - DCD follows the carrier signal (default)	
AT&TBR	1 - Enable timed break recall (default) 0 - Disable timed break recall	
AT&BD	1- blind dial enabled 0 - blind dial disabled (default)	
AT&CC	1 - in half duplex modes, on RTS active, only assert CTS if the remote carrier is off (DCD is clear) 0 - in half duplex modes, on RTS active, assert CTS irrespective of DCD status (default)	
AT&CH	1- in full duplex, do not hang up if no carrier (used for approvals only) 0 - in full duplex, normal hang up on no carrier (default)	
ATZn	Select modem profile where n is; 1 - Windsor 500, Windsor 700 version 8, Windsor modem Receiver. 2 - Vigil V64 Mk2 panels using V23 mode 3 - Vigil V64 Mk1a panels using V23 mode	
ATZnCC	As ATZn with the country code added. For example, ATZ144 would configure the modem for use with GuardStation in the UK (country code 44).	

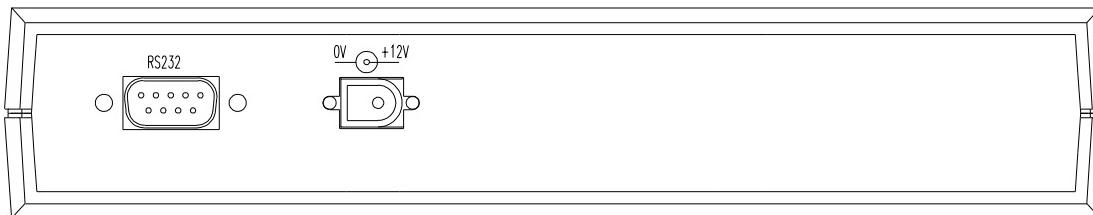
Result Codes	
Verbose Mode	Numeric Mode
OK	0
CONNECT SDP (300bps FSK/DTMF)	1
RING	2
NO CARRIER	3
ERROR	4
CONNECT 1200 (V22)	5
NO DIALTONE	6
CONNECT 2400 (V22bis)	10
CONNECT 600 (V22)	11
CONNECT SDS (SmartDial Super or SmartComm)	12
Forbidden Call (numeric only)	103
LINE BLOCKED	verbose only
LINE CLEAR	verbose only
NO 50V	verbose only

Windsor Modem**RX Variant**

The front panel of the Windsor RX modem has 2 RJ11 sockets for a telephone handset connection and the incoming PTT line and 12 status LED indicators.



The rear panel of the Windsor RX modem has a 9 way D type RS232 connection and a DC supply input. A suitable RS232 cable for connection to the PC host must be used (not supplied).

**Windsor RX Modem****Line Monitor Speaker**

A speaker output circuit will be provided to allow listening in to call progress tones and voice mode conversations. The volume will be controlled via software and can be disabled if required. A 35 Ω loudspeaker is fitted as standard on the Windsor modem RX.

Windsor RX Modem**Characteristics**

Current consumption	300 mA maximum
Operating temperature range	0-50 °C

A suitable power supply capable of supplying 12v (+2, -1) @ 300 mA must be used.

Windsor Modem**Defaults**

The Windsor modem has 3 sets of defaults which are shown in the table. The appropriate profile can be selected using the ATZ command.

Related Commands	ATZ1	ATZ2	ATZ3
ATV	ATV0	ATV1	ATV1
ATB	ATB0	ATB2	ATB2
AT%B	AT%B2	AT%B1	AT%B1
ATP	ATP1	ATP1	ATP1
ATT	ATT0	ATT0	ATT0
AT&TBR	AT&TBR1	AT&TBR1	AT&TBR1
AT&BD	AT&BD0	AT&BD0	AT&BD0
AT&A	AT&A0	AT&A0	AT&A0
AT&RI	AT&RI0	AT&RI1	AT&RI1
AT&D1	AT&D1=1	AT&D1=1	AT&D1=1
AT&D2	AT&D2=1	AT&D2=100	AT&D2=100
AT&D3	AT&D3=1	AT&D3=10	AT&D3=10
AT&CH	AT&CH0	AT&CH0	AT&CH0
AT&CC	AT&CC0	AT&CC1	AT&CC1
AT&CD	AT&CD0	AT&CD0	AT&CD1
AT&LB	AT&LB=00000	AT&LB=00000	AT&LB=00000

The country code can also be appended to the ATZ command, for example ATZ144, for the UK.

SmartComm

SmartComm is a combined dialler/modem which connects to Windsor on the communications port. SmartComm is fully programmable from a Windsor keypad and can share a telephone line with a telephone handset(s). SmartComm can be used to signal alarms in ADEMCO fast format. As a modem SmartComm operates at 1200 baud and can be used for downloading from a remote PC.

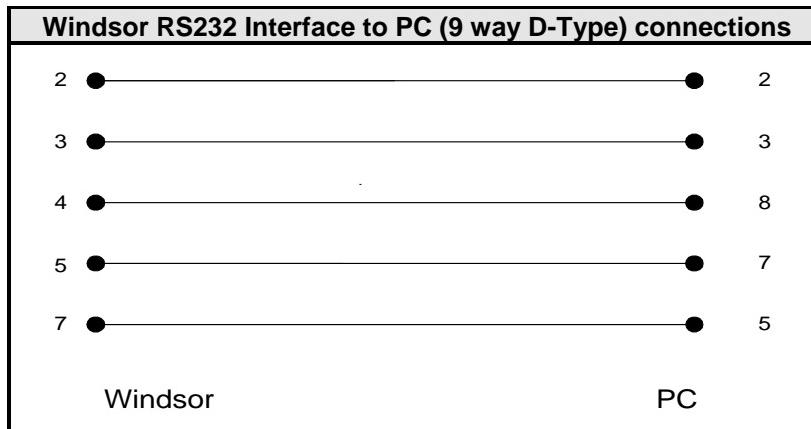
To install the SmartComm PCB in Windsor it must be mounted on the pillars provided. The pillars are mounted directly to the chassis of the Windsor and the SmartComm PCB is mounted on these. The SmartComm cable goes directly from CN1 on the SmartComm to CON 6 on the main PCB. The cable and the mounting pillars are supplied in the SmartComm installation kit. SmartComm is a combined Dialler/Modem for communicating with a central station or for up/down load of information to and from the Windsor control panel. The SmartComm is installed directly inside the Windsor control panel.

RS 232 Interface PCB

The Windsor RS232 Interface board connects to the communications port, CON 6, of the main PCB. The function of the RS232 Interface board is to convert the TTL voltage levels on the main PCB to the RS232 voltage levels. An RS232 Interface board will be required if you are connecting Windsor to a PC, modem, PAKNET or X25 pad. It is not required if you are connecting to SmartComm or Pacom. **When connecting to a PC you must use a crossed cable (RX-TX and CTS-RTS).**

There are 2 types of RS232 Interface board used in Windsor. The Windsor mark 1 RS232 Interface board is identified as PC922 and has a 12 way connection to the main PCB and the Windsor 500 RS232 Interface board is identified as either 22-00102 or PC841 and has a 15 way connection to the main PCB. Both types are fitted with a 25 male way D-type connector.

9 way D-Type	25 way D-Type	Windsor Mark 2 - CON6	Windsor Mark 1 - CON6
		1 +12V	1 +12V
3	2	2 TXD	2 TXD
2	3	3 RXD	3 RXD
7	4	4 RTS	4 RTS
8	5	5 CTS	5 CTS
4	20	6 DTR	6 DTR
6	6	7 DSR	7 DSR
1	8	8 DCD	8 DCD
9	22	9 RI	9 RI
		10 No Connection	10 5v
		11 No Connection	11 0v
		12 +5v	12 No Connection
		13 No Connection	
5	7	14 0v	
		15 No Connection	



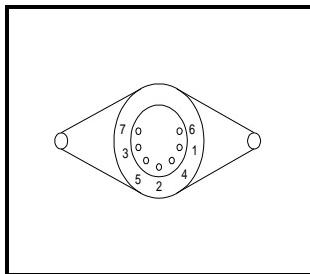
Printer Port

A PC may be connected directly to the printer port if the panel is fitted with version 3.00 or later software.

If the main PCB printer connection (CON 11) is being used refer to the PCB connections section of this manual.

If the panel printer cable assembly is being used the 7 pin DIN connections are shown below.

DIN Connector	Function
1	RX
2	0v
3	TX
4	CTS
5	RTS
6	
7	



In both cases the cable connection to the PC must have crossed connections (RTS to CTS and RX to TX).

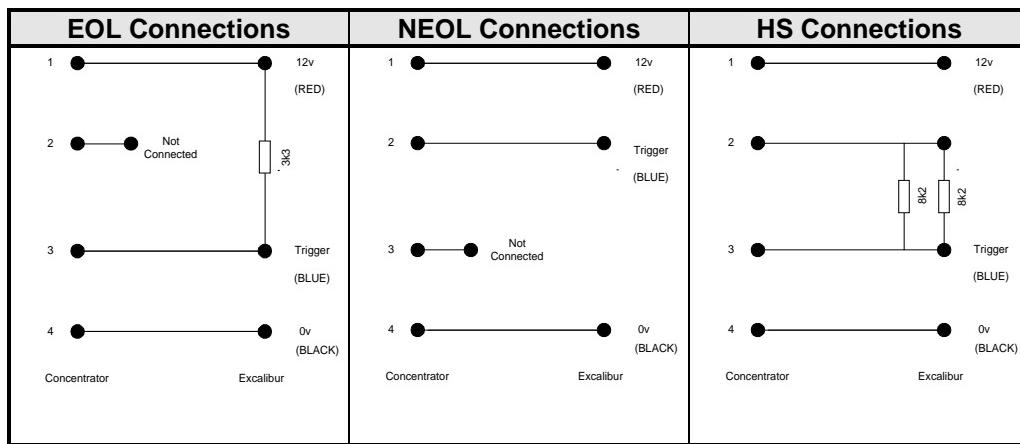
Light Control System

Windsor can have up to 4 light zones programmed. Only 2 types of circuit can be programmed to operate in a light zone, Excalibur daylight (Exc-D) and Excalibur trigger (Exc-T). **There is no connection between a Windsor area and a light zone.** Each light zone has a programmable TX output which can be controlled by a trigger circuit, a daylight level, manually, by a timer or by an alarm event. A light zone output can be any programmable output in the system, for example a channel on a relay board, however it will normally be an output on a mains switch unit.

Light Control System

Connecting Excalibur Sensors

An Excalibur sensor is connected to 2 separate inputs of an external concentrator and should be programmed as 2 circuit types, Exc-T (trigger) and Exc-D (daylight). The connections for an Excalibur trigger are shown below. The Excalibur daylight line (yellow wire) must be connected to the DAY input of circuit 8 of an external concentrator. LK4 on the concentrator must be in the DAY position.

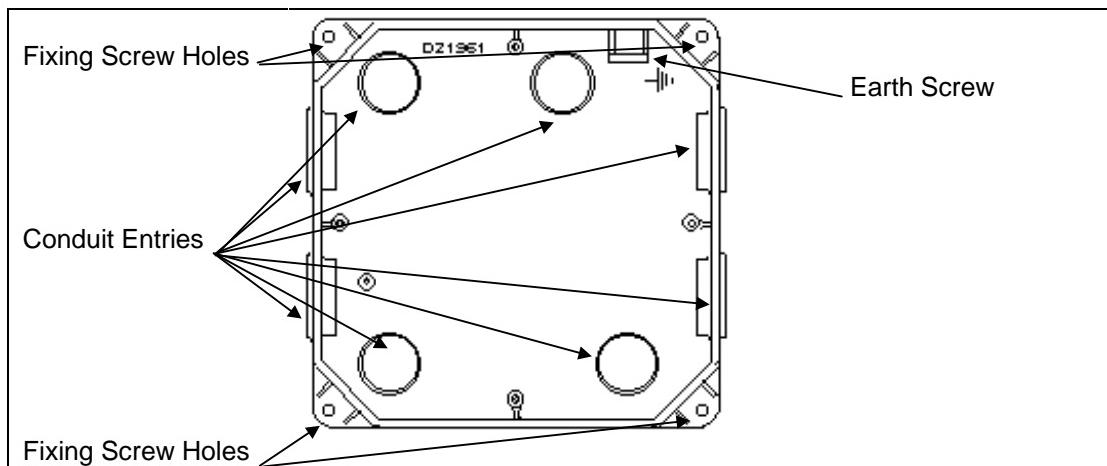


Light Control System**Mains Switch Unit**

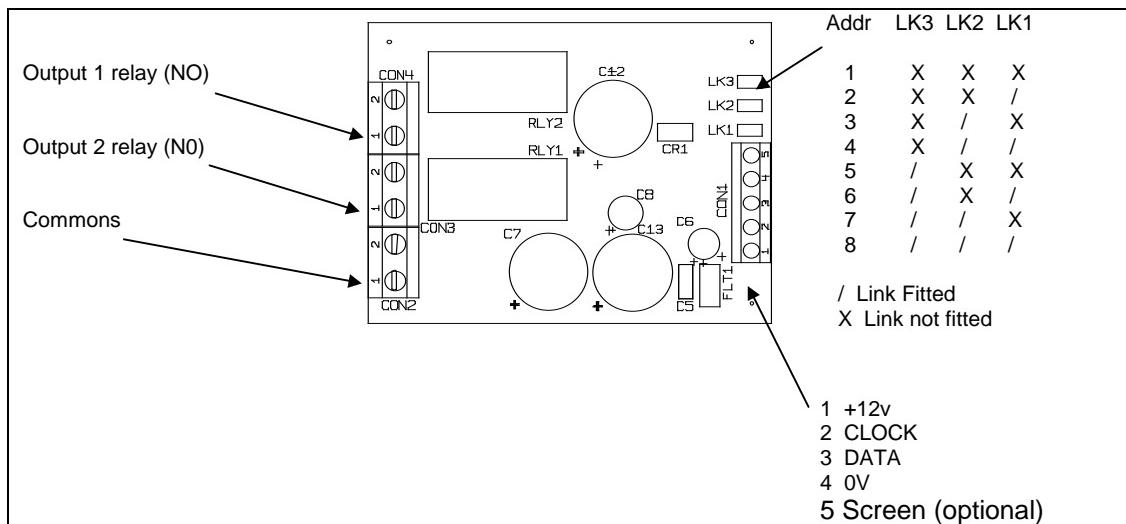
The Windsor mains switch unit (MSU) has 2 independently programmable relay outputs each capable of switching a 2kW load. Up to 8 MSUs can be independently addressed and, if required, more than one MSU can be programmed with the same address to give multiple outputs controlled by the same programmable function.

Mains Switch Unit**Installation**

Remove the cover and mark the screw holes, fix the unit to the wall using suitable screws.

**Mains Switch Unit****Addressing**

The unit is connected to Windsor on the concentrator bus and is addressed using the Links LK1, 2 and 3. The switching outputs are mains rated relays. The common can be either a 0V or neutral connection. The outputs 1 and 2 are used to switch live. The outputs are programmed using the software programming. The mains switch unit is an exterior device conforming to IP54. The unit can be used to switch mains or voltage controlled devices such as exterior lights up to 2kW per relay.



Mains Switch Unit**Wiring Guidelines**

The following guidelines are supplied in order to ensure the safe installation of the mains switch unit. Failure to follow these guidelines may create hazardous electrical conditions for the system user. Approval of the apparatus may also be invalidated if, as a result, it then ceases to comply with the standards against which approval was granted.

Mains Switch Unit**Mains Supply**

It is recommended that the main cable :-

- Be approved to IEC Publication 227 : Polyvinylchloride insulated cable of rated voltages up to and including 450/750V (CEE Publication 13) : (BS6500).
- Be provided with a green/yellow core for connection to the earth terminal of the unit.
- Be fitted in a manner such as that it is protected from any strain, abrasion, twisting or subsequent damage.

The mains supply must only be connected to the terminal block provided.

The wire which is coloured green/yellow must be connected to the terminal marked by the earth symbol. This terminal is provided only as a means of linking the earth wires from the mains supply to the protective earth terminal of the light/load. It itself, does not provide a protective earth for the Power Switch Unit which is double insulated.

The wire which is coloured blue must be connected to one of the terminals marked common.

If Output 1 is to be used, then the wire which is coloured brown must be connected to any one of the terminals labelled Output 1.

If Output 2 is to be used, then the wire which is coloured brown must be connected to the any one of the terminals labelled Output 2.

Mains Switch Unit**Connections to Light/Load**

It is recommended that the mains cable :-

- Be approved to IEC Publication 227 : Polyvinylchloride insulated cable of rated voltage up to and including 450/750V (CEE Publication 13) : (BS6500).
- Be provided with a green/yellow core for connection to the protective earth terminal of the light/load.
- Be fitted in a manner such that it is protected from any strain, abrasion, twisting or subsequent damage.

The supply to the load must only be connected to the terminal block provided.

The wire which is coloured green/yellow must be connected to the terminal marked by the safety earth symbol. This terminal is provided only as a means of linking the earth wires from the mains supply to the protective earth terminal of the load.

The wire which is coloured blue must be connected to one of the terminals marked common.

If Output 1 is to be used, then the wire which is coloured brown must be connected to the other terminal labelled Output 1 which is not used for the mains supply.

If Output 2 is to be used, then the wire which is coloured brown must be connected to the other terminal labelled Output 2 which is not used for the mains supply.

Mains Switch Unit	Precautions
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Precautions must be taken to prevent electrical contact between all mains voltages (including mains wiring and mains connector block) and low voltage circuitry (including data bus wiring and data bus connector block). The necessary precautions include;

- Good workmanship and proper working materials
- Interconnection wiring conforming to good wiring practice
- Use of cable which is PVC insulated and sheathed (i.e.. double insulated cable)
- Use of cable suitable for the voltage and current appropriate to the application
- Attention to cable routing
- Dressing cable to length
- Use of suitable fixings for supporting and routing cable (cable ties and clips)
- Following the requirements of the IEE's "Regulations for Electrical Installations"

All external wiring must be of a sufficiently high standard to enable the installed system to comply with BS4737.

Change History

Change History	Issue B
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1. Added multi-level contents section.
2. Added SmartDial Super details and SmartDial features.
3. Added new table of concentrator order codes.
4. Added battery monitor LED colours to main PCB connections table.
5. Added new RS232 interface PCB number.
6. Added connections column to the Vigil concentrator outputs table.
7. Added Inova programming options.

Change History	Issue C
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1. Added Windsor modem section.
2. Added HS concentrator section.
3. Added details of SmartDial Super v2.07 features.
4. Added AV60 section.

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